THE ARCHITECTURAL FORUM

AUGUST 1919

COMPETITION PROGRAM—A SMALL BRICK HOUSE—PAGE 2

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VOLUME XXXI NUMBER 2

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PLATE ILLUSTRATIONS

LETTERPRESS

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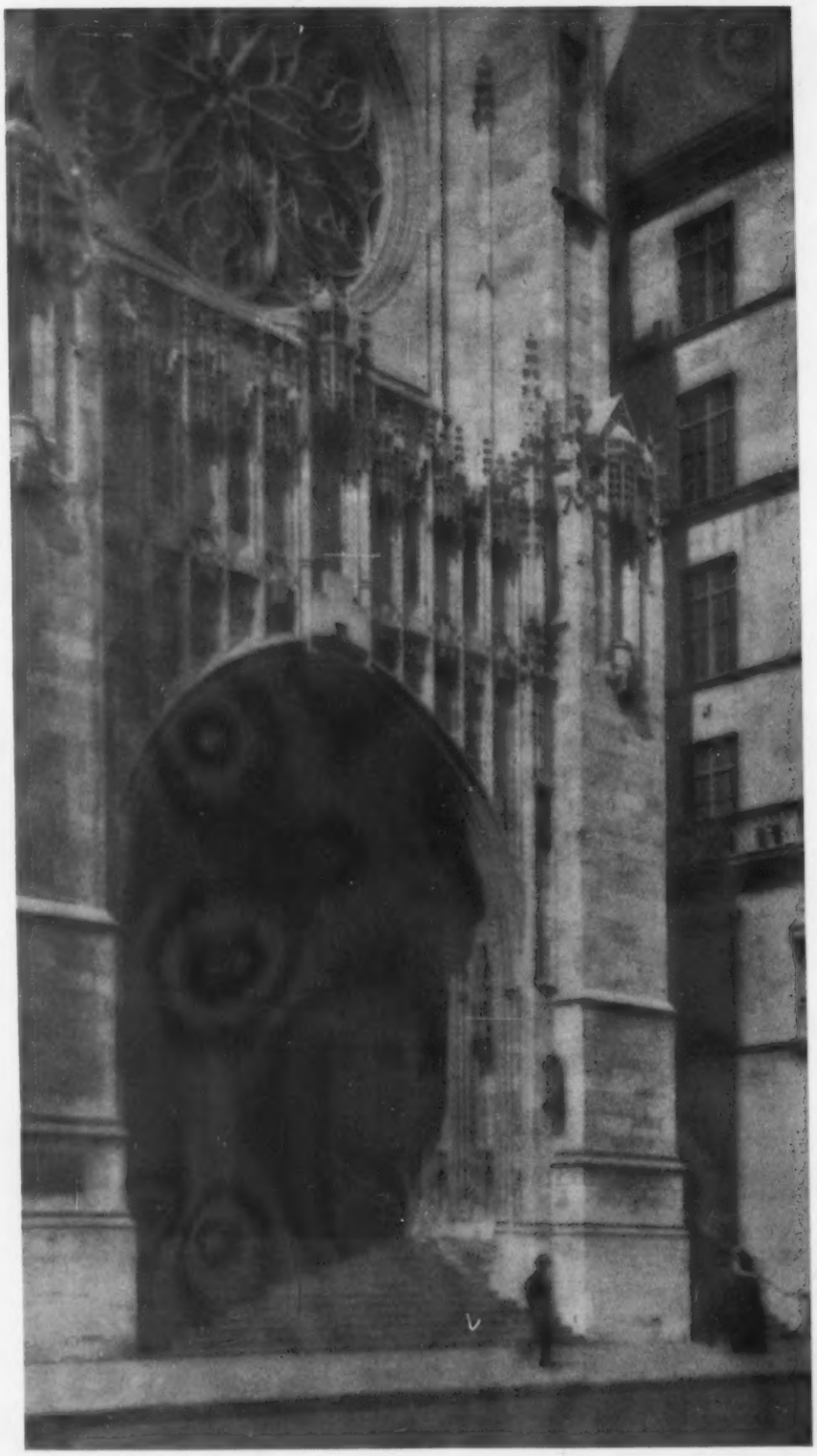


ENTRANCE, ST. THOMAS' CHURCH, NEW YORK CITY
CRAM, GOODHUE & FERGUSON, ARCHITECTS

Photograph by John Wallace Gillies

THE ARCHITECTURAL FORUM
FOR QUARTER CENTURY THE BRICKBUILDER
VOLUME XXXI AUGUST 1919 NUMBER 2

Architecture of the Dalmatian Coast

PART II

By HAROLD DONALDSON EBERLEIN

SUCH freedom of composition and such license in grafting contemporary modes upon earlier bodies, as we noted in the reference to the front of the Rectors' Palace at Ragusa (mentioned in the preceding paper), we find even more strikingly exemplified upon the façade of the near-by Dogana.* The ground floor and first story of this very composite structure belong to the fore part of the fourteenth century or, in all probability, to a somewhat earlier date, judging from the evidence of the double-tiered arcade surrounding the cortile; the Venetian Gothic *front* of the first story, with its two ogee headed windows flanking a traceried square headed window, all of which from their appearance might have been transported bodily from the Canal Grande, dates from the fifteenth century; the loggia of the ground floor and the second story, with its square headed windows, its pilastered and pedimented niche, and the extraordinary crocket-like pinnacles arrayed upon the eaves proclaim Renaissance parentage of the early sixteenth century.

Whatever one may think of the *legitimacy* of such treatment, its *interest* is undeniable. To mention, for the sake of comparison, only one or two similar instances of architectural medley, a number of the French chateaux show the investiture of a palpably Gothic body with Renaissance decoration; likewise, plenty of cathedrals in England and France exhibit the work of successive ages, either by way of completion or repair or else as construction *de novo*, joined on to or incorporated in an earlier fabric. One can almost always say of such cases, without much hesitation, that here the work of so-and-so ended and the work of so-and-so began. But in many of the Dalmatian buildings we discover a singularly fluid blending of the divers elements that endues each completed structure with a perplexing homogeneity; that baffles any attempt at cursory analysis; and yields up its secrets only under the closest scrutiny.

The same felicitous outcome of commingled modes may be found in the Romanesque cathedral of Traù,* begun in the thirteenth century, where the massive piers of the nave and the stilted semicircular arches, almost Roman in their severe and ponderous solidity, comport not ill with the pointed arches and quadripartite rib-vaulting above; we find it again in the cortile of the Palazzo Comunale of Traù, which reminds one so forcibly of the Bargello in Florence. But why multiply instances? The illustrations speak eloquently for themselves. While the inventive genius of Dalmatian-born architects often made itself felt in other parts of Italy outside their own native cities, it is plain to be seen that the influence of Venice was one of the potent forces in the development of Dalmatian architecture. But far more potent than the visible influence of tangible forms and precedents was the influence of the Venetian *spirit*.

The architecture of "La Serenissima" displayed a peculiarly agreeable fresh freedom and unfettered sweep because the men who moulded it dared largely. They were of a venturesome and experimental turn of mind, and not unduly shackled by precedent. Not all of their experiments, by any means, were wholly successful, but many of them were, and the daring of these men went far towards creating the charm of freshness and vitality apparent in their work. The Italians as a race have never been afraid of experimentation in art, and though vigorous champions of precedent were never lacking, there were always plenty of daring spirits ready to blaze new trails. This is one explanation of Italian exuberance of form and fecundity of invention. But, at the same time, we must remember that the insurgents who blazed new trails were not ignorant men unacquainted with precedent, who fell into the ranks of revolution and used innovation as a cover for incompetence. They were bold with the confidence of knowledge and conviction that the novelty they championed would effect improvement and had at least some sound logical basis.

When we come to examine the subject of *detail* in Dalmatian architecture, we find a field of no less fascinating interest. The same ready flexi-

* Illustrated in the first article, July, 1919.

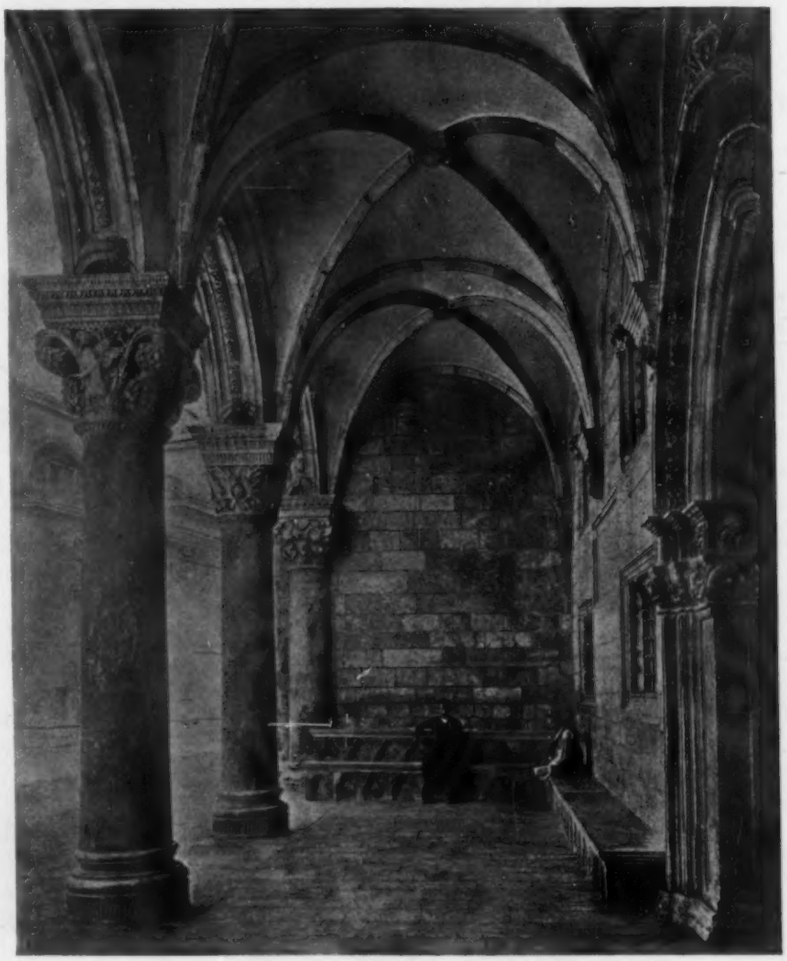
Detail of Capital, Palazzo del Rettore

As the original five columns and two terminal half-columns of Curzolan stone were to be used, and also some of the original capitals, the hiatus between the old capitals and the spring of the new arches was adroitly bridged by superposing a *new* abacus upon the *old* abacus. The upper illustration shows one of the new capitals with winged amorini and garlands, in itself an agreeable and diverting conceit of unmistakably Renaissance inspiration, and a heavy abacus with four elaborately sculptured courses of elastic enrichment.

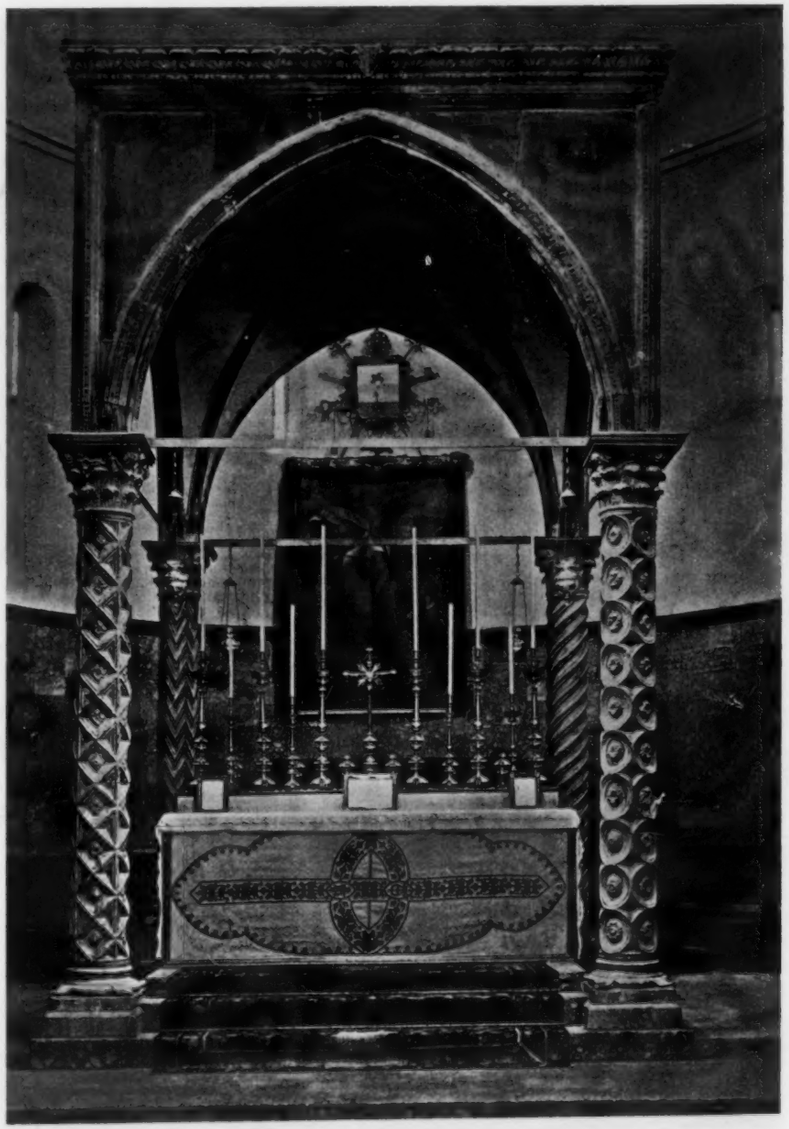
Of the three foliated capitals visible in the lower illustration, two of them, "veritable gems of Gothic sculpture," belong to the earlier date, and here may be seen the operation of Orsini's piecing-out process. The capital nearest, at the left, and the abacus belong together, being both of the newer design. The second capital, a part of Onofrio's work, has its original sturdy fluted abacus, and upon this is set Orsini's new four-coursed abacus with classic enrichment, uniform with that in the upper illustration. The farthest capital at the

bility and rich invention are manifest in the choice and application of *motifs*. The doorway to the garden of the Palazzo Nimira — once the home of that extraordinary man, Marc' Antonio de Dominis, sometime Archbishop of Spalato, Dean of Windsor, and the first to propound the true theory of the solar spectrum and the rainbow — affords a delightful fragment of Venetian Gothic detail, quite characteristic of Arbesan domestic architecture, unalloyed by extraneous elements.

Reverting once more to the Rectors' Palace at Ragusa, one may see a most ingenious accommodation of detail to the exigencies of rebuilding and alteration. When Georgio Orsini and Michelozzo, after the powder explosion, took down the central portion of the façade and replaced Onofrio di La Cava's pointed arches in the loggia by round arches, it became necessary to raise the spring of the new arches to adjust them to the height of the vaulting constructed for the earlier pointed arcading.

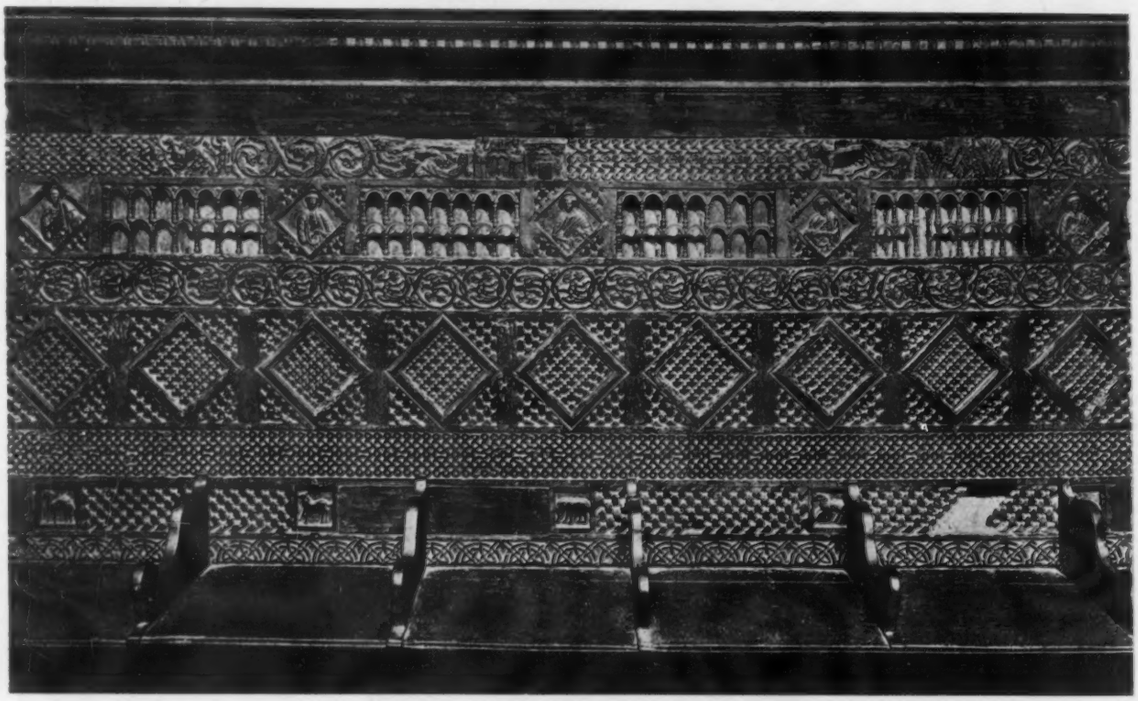


Loggia of the Palazzo del Rettore, Ragusa



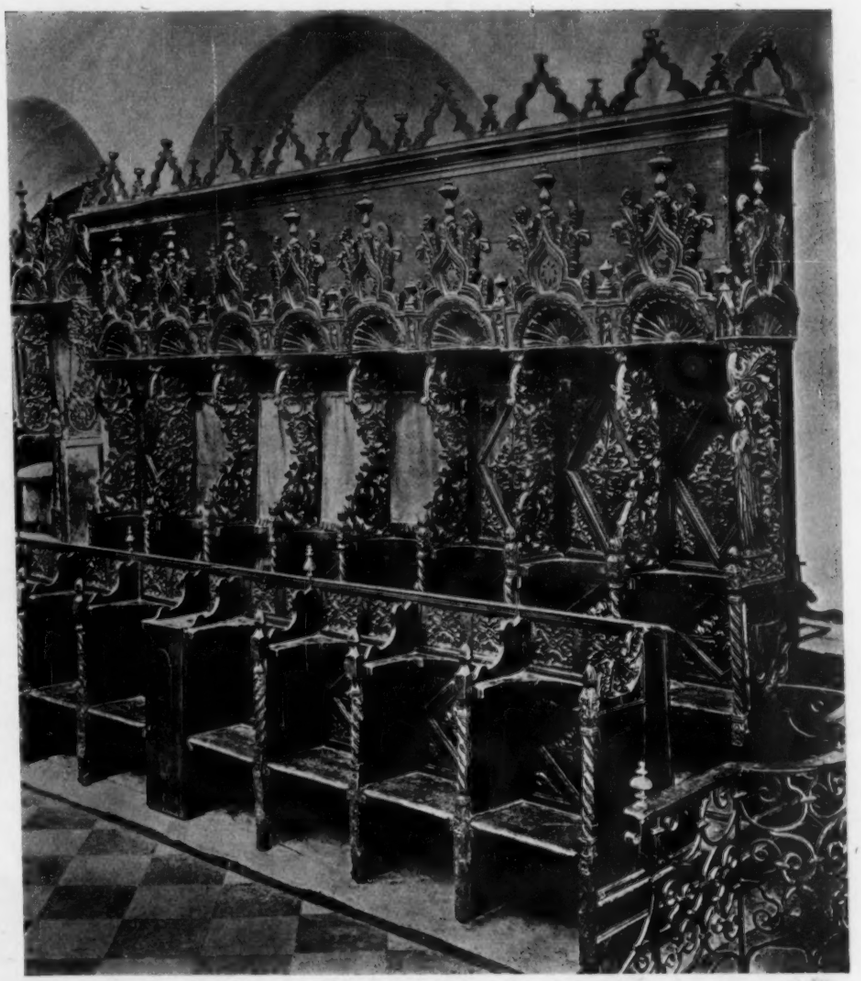
TRANSEPT DOORWAY AND HIGH ALTAR OF CATHEDRAL AT ZARA, DALMATIA

GATEWAY OF A GARDEN, ARBE



CHOIR STALLS IN CATHEDRAL, SPALATO

end of the loggia, also of the earlier date, has a shallow abacus carved with a band of running leaves which, unfortunately, does not appear clearly, but the superposition of the second abacus is plainly discernible. The imbricated bands of oak leaves fastened with ribbons, and all the other moulded and carved decoration pertaining to the arches, obviously belong to Orsini's design. The mezzanine windows, which may be descried in both illustrations, the ground-floor windows, the carved consoles that carry the vaulting, and the pointed doorway with its carved capitals, stilted imposts and richly wrought mouldings, are all parts of the earlier work.



Choir Stalls in Cathedral, Arbe

Considered from an archæological point of view, the combinations and dovetailing of structure and detail in the Rectors' Palace constitute a master piece of ingenuity. Considered on architectural grounds, they form a lasting tribute to the judgment, the perception and the broad command of style that enabled Michelozzo and Orsini to transform the very distinctive work of a former master and harmoniously blend with it their own preferences to create an *ensemble* of consummate beauty.

The cipolin marble columns of the baldacchino above the high altar in the duomo of Zara, with their diapered sunk-work and the rich Romanesque embellishment of the transept doorway in the same church, convey a slight idea of the profusely elaborate detail which the thirteenth and fourteenth century Dalmatians, with truly Italian fecundity of imagination, lavished upon their buildings. The carving of the jambs, lintel and tympanum is distinctly reminiscent of Byzantine ancestry, and one of the refreshing "irregularities" of detail, so characteristic of Dalmatian work, when judged by standards elsewhere prevalent, appears in the horizontal band of incised palmate scroll carving, the incisions filled in with black cement.

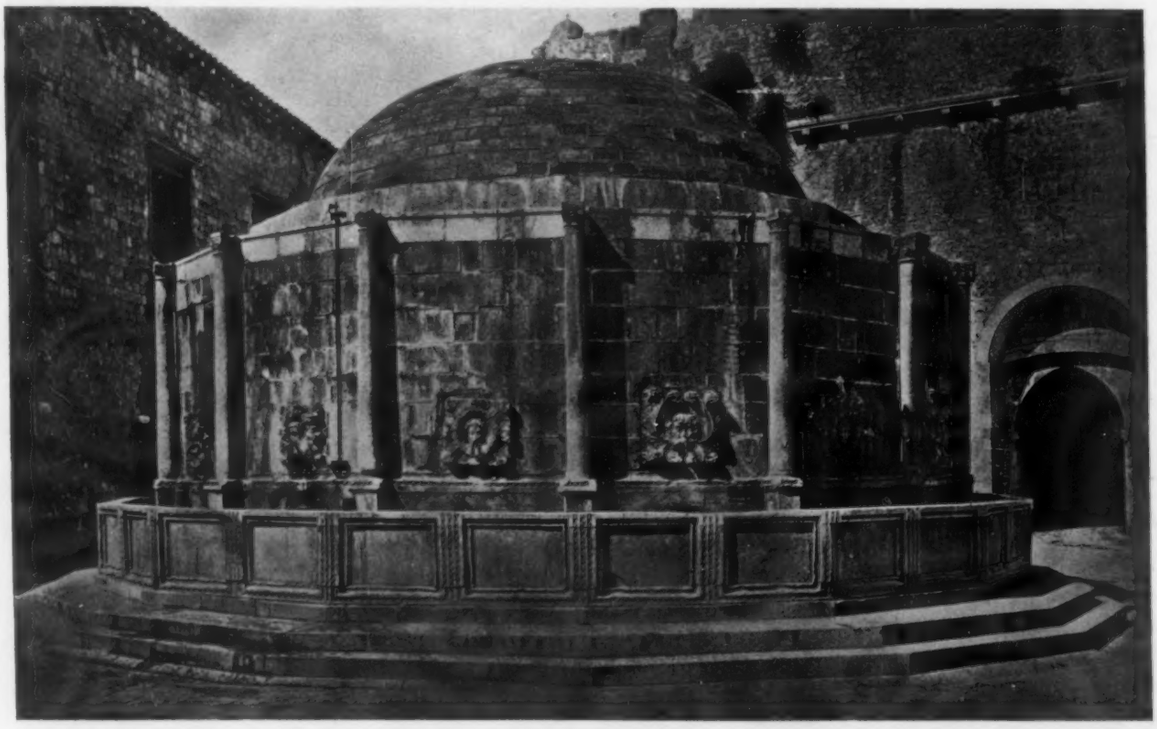
A comparable bit of whimsicality in the handling of detail is to be found in the gable cornice of the façade of the duomo at Curzola, where the unquestionably Gothic trefoil tracery with interlaced monsters is combined with a frill of little arches and Renaissance scallop shells, topped in turn by a Gothic running leaf *motif*. Furthermore, midway the gable the treatment perceptibly changes and different forms appear, although the richness of effect is not diminished and interest is rather intensified than otherwise. This frequent recurrence of whimsicalities in detail and, despite seeming incongruities, the felicity of the outcome, impart to Dalmatian architecture not a little of its naïve charm. The successful exercise of such elasticityof interpretation offers a liberal lesson in permissible decorative freedom. However we classify the outward forms employed, the practice is medieval in spirit and savours of the time when work contained something of the leaven of play, and caprice meant not objectionable eccentricity, but bore witness to a legitimate and pleasure-giving individuality in his work on the

part of the craftsman. A profitable suggestion therefrom we might draw now when the mania for tight and stupid standardization bids fair to crush all spontaneity and enlivening playfulness, and when the obsession for abject uniformity, even in ornament, reminds us that it has been truly said that the human countenance, if both halves were precisely alike with the center of the nose as a dividing line, would have an expression of complete imbecility.

Small Fountain at Ragusa

The choir stalls of the duomo at Spalato exhibit not only a reasonable diversity and engaging asymmetry of decoration, but also testify to the Dalmatians' catholic inclusion and cultivation of decorative influences derived from widely divers sources. Thanks to the all-embracing ramifications of Venetian commerce, Coptic influence played its part in the Renaissance development of this Venetian city, just as it did in the other parts of the Venetian dominions, and left its trace in the reticulated frets or lattices of the stall backs.

The Dalmatians well knew the value of free undecorated surfaces; they understood how much enrichment was enhanced by concentration, and when they concentrated they were often prodigally lavish. But that they also were capable of the most elegant reticence may be seen from the fountain of Onofrio at Ragusa — a work whose just proportions, restraint and distinction of design render it a fit subject for emulation.



Fountain of Onofrio, Ragusa

The Dominion of Canada Housing Loan

By S. T. J. FRYER, ARCHITECT
Deputy Vocational Officer for Ontario, Department of Soldiers' Civil Re-establishment

IN December of last year a committee, known as the Housing Committee, was formed by the Cabinet of the Government of Canada to investigate the need for additional housing accommodation throughout the Dominion, to take up with the Provincial Governments any housing programs they had in view, and to report on general principles to be followed to secure the results aimed at by the Government Order-in-Council P. C. 2997, passed on Dec. 3, 1918. This Order-in-Council set aside as a loan to the Provinces the sum of $25,000,000 for the purpose of promoting the erection of dwellings to relieve congestion of population, advances from the appropriation being in proportion to the population in the several provinces.

A report of this Housing Committee as submitted by its Chairman, the Hon. N. W. Rowell, states in detail that:

(1) The object of the Government in making provision for a loan of $25,000,000 at 5 per cent to the Provincial Governments for housing purposes is:

(*a*) to promote the erection of dwelling houses of modern character to relieve congestion of population in cities and towns;

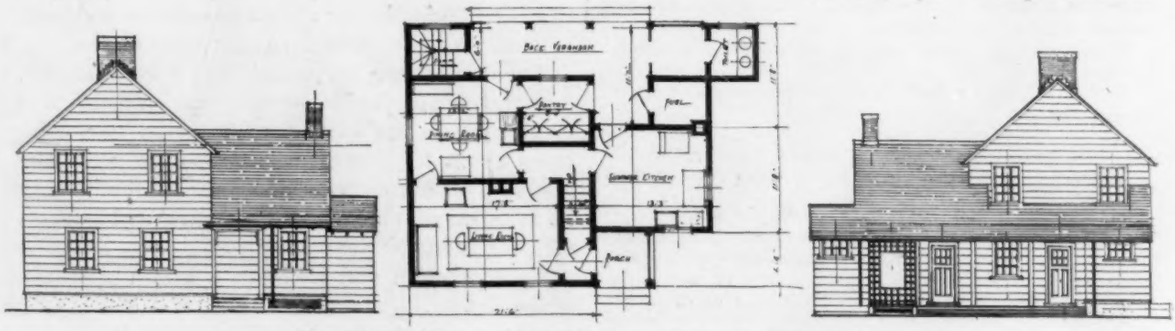
(*b*) to put within the reach of all workingmen, particularly returned soldiers, the opportunity of acquiring their own homes at actual cost of the building and land acquired at a fair value, thus eliminating the profits of the speculator;

(*c*) to contribute to the general health and well-being of the community by encouraging suitable town planning and housing schemes.

It should be mentioned, too, that other objects the Government had in view in making this loan were the stimulation of building operations during the transition period from war to peace and the providing of employment for returned soldiers.

For these last two reasons, particularly, it is hoped the Provinces will take advantage of this loan as early in the year as possible. The special mention of the returned soldier in clause (*b*) emphasizes an all too apparent fact that the problem of the returned soldier is a big and complex one: indeed, one that affects every phase of national and economic life in Canada. Until industrial conditions are fully settled on a peace-time production basis, the providing of employment for the thousands of returning troops is a serious problem, more readily appreciated when it is remembered that some 550,000 soldier citizens must be absorbed into the civil and industrial life of a country whose total population is less than 8,000,000.

During the four years of war very little building of workmen's dwellings and houses of moderate cost was carried out. With the returning of thousands of troops and their dependents and the natural increase of population, the housing problem has reached an acute stage and one that must be remedied immediately if serious discontent in the community at large is to be avoided. Many, because there is no accommodation reasonably close, have to live at long distances from their work, and even where it is possible to obtain houses the rentals are beyond the means of the average workingman — it has been stated that these are causes of a good deal of the present labor unrest. However, whether it is so or not, there is no doubt that the housing of the working classes is a matter for very serious consideration; it is of national importance, affecting vitally, health, morals and general well-being of the entire community. In this respect the report of the Housing Committee, says: "The provision of



Floor Plans and Front and Rear Elevations of Cottage for Farm Hands

houses, so far as it may be regarded as a public duty, is a matter which comes more properly within the jurisdiction of the provinces and municipalities, and in ordinary circumstances, the question of what regulations should be imposed and what policy should be adopted, in regard to the administration of housing schemes, are matters for these Governments. As the Dominion Government will lend the money on the general security of each province, it is not necessary to impose financial regulations as to the means which should be employed to safeguard the loans."

Having regard, however, to the responsibilities incurred by the Dominion Government in providing money, and to the object for which the money is proposed to be lent, loans will be made to the Provincial Governments on the following basis:

(1) Each province shall prepare and submit to the Dominion Government for approval a general housing scheme, setting out the standard conditions to be complied with in connection with local housing schemes, such as the grouping of houses, provision of open spaces, sizes and heights of houses and rooms, provision of light and ventilation, heating, lighting, character of materials, etc., which it is proposed should be enforced as the minimum requirements for health, comfort and convenience.

(2) The object of the Dominion Government being to facilitate the erection of dwellings at a moderate cost suitable for workingmen, particularly returned soldiers, the following has been fixed as a maximum which may be loaned per dwelling, having regard to conditions existing in the various provinces.

(*a*) Detached or semi-detached dwellings with walls constructed wholly or partly of frame, stucco on frame, brick veneer, inclusive of the capital value of the site and necessary local improvements;

With 4 or 5 rooms exclusive of bathroom and summer kitchen, $3,000.

With 6 or 7 rooms exclusive of bathroom and summer kitchen, $3,500.

(*b*) Detached, semi-detached groups of three or more or duplex (cottage flat) dwellings with walls of brick, hollow-tile, stone or concrete and roofing of fire-proof materials, inclusive of the capital value of the site and necessary local improvements;

With 4 or 5 rooms exclusive of bathroom and summer kitchen, $4,000.

With 6 or 7 rooms exclusive of bathroom and summer kitchen, $4,500.

(3) Ownership of land — public money may be advanced for building houses on sites owned by:

(*a*) The Provincial Government or Municipality.

(*b*) Housing Societies or Companies comprising groups of citizens associated to promote good housing, supplied with proper improvements, such societies or companies to have not more than a statutory limitation of dividends payable on stock of 6 per cent.

(*c*) Owners of lots for the purpose of erecting houses for their own occupation.

(4) Terms of years for repayment of the loan: The Federal Loan will be repayable by the Province over a period of twenty years. Provided that in order to encourage the erection of more durable buildings, and to bring the financial terms within the reach of a larger number of workers, the period of twenty years may be extended to thirty years in respect of any portion of the loan which the Provincial Government may decide to relend for thirty years for such purposes as purchasing land or erecting buildings under the above class. Repayments by the Provinces on account of Federal Loans may be made quarterly if so desired, or otherwise as may be agreed upon.

Definite plans are in process of formation by most of the Provinces with the object of taking advantage of the Dominion Housing Loan. Ontario is perhaps more advanced than any of them, having already passed a Provincial Housing Act as the result of careful study and investigation of this problem since 1916. It is one of the most advanced housing measures provided by any government and was passed irrespective of the Dominion loan.

Under the Ontario Housing Act the Lieutenant-Governor in Council may, as considered necessary, borrow money other than from the Dominion Government.

The Province may lend to a municipal corporation the full cost of the land acquired and the houses erected by its commission and all money required on account of loans to housing companies and to private persons.

Municipal councils shall appoint a commission to be known as the Housing Commission of the Municipality, for the purpose of carrying out the provisions of the Act.

This commission may erect on land acquired by it, within the limits of the municipality, and any company may erect on land acquired by it in any municipality to which this Act applies, dwelling houses of a class suitable for the accommodation of persons who have been on active service during the present war with the naval or military forces of Great Britain or her allies and who are residents of Ontario and workingmen of modest means.

The cost of any house shall not exceed $2,500, and the cost of the house and land on which it is erected shall not exceed $3,000. In particular cases or in a particular municipality, with the approval of the director, the cost of a house may be $3,000, and the cost of the house and land on which it is erected may be $3,600.

A Commission may make loans for the purposes of the Act to:

(*a*) A company for not more than 85 per cent of the actual value of the land and house;

(*b*) A private person who desires to erect a house for his own occupation on land owned by him, to the full cost of the house, provided the house is erected according to the provisions of the Act;

(*c*) A private person who desires to erect a house on land owned by the Commission, if he pays in cash the value of the land, or 10 per cent of the total cost.

(*d*) A person who has been on active service during the present war, if he resides in the municipality and did so reside at the time of his enlistment, to the full cost of the house. The same privilege is extended to the widow of a soldier and to his father or widowed mother.

A farmer desiring to erect a house on his farm for his married son or a married man employed by him may obtain a loan to the full value of the house on the recommendation of the director.

A man who buys a house from the Municipal Commission or from a housing company may secure it by paying $300 cash, and the balance in monthly payments of about $18 for twenty years. He may pay the whole or any part of the purchase money at any time during the term of the agreement. The agreement may be canceled on default being made in any payment if the default continues for three months; but the purchaser has the right before default, with the consent of the Commission, to assign the agreement. The purchaser covenants to keep the house in repair and to pay taxes and insurance. The man unable to pay $300 in cash may deposit with the Commission security to that amount, or his employer may guarantee the amount from his salary by special agreement, or some citizen may sign a bond on his behalf.

A man owning a lot may secure the money required to erect a house thereon from the Commission at 5 per cent interest, subject to the provisions contained in the Act.

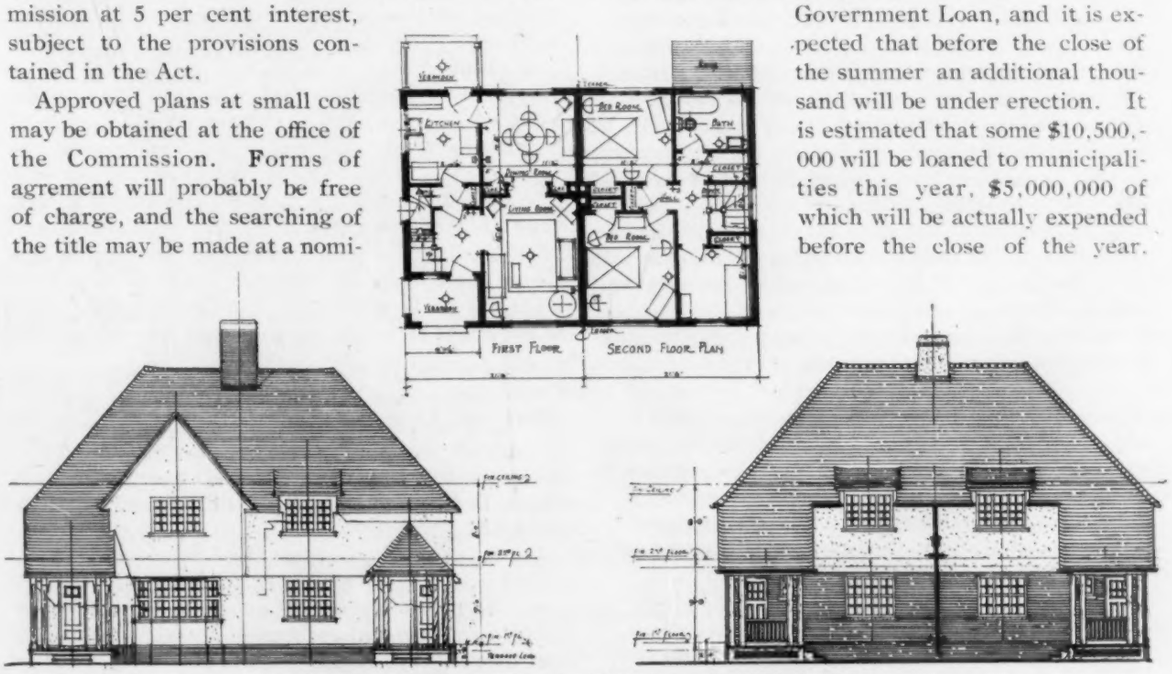
Approved plans at small cost may be obtained at the office of the Commission. Forms of agrement will probably be free of charge, and the searching of the title may be made at a nominal charge. The usual costly and irksome procedure in securing a house will be reduced to a minimum.

Provision is also made whereby municipalities may grant special taxation as follows:

Houses assessed at $2,000 and less to be assessed at 50 per cent of their assessment; houses assessed from $2,500 to $3,000, at 70 per cent of their assessment; houses assessed from $3,000 to $3,500, at 80 per cent of their assessment; and houses assessed from $3,500 to $4,000, at 90 per cent of their assessment. No reduction on houses assessed at $4,000 and over that amount.

The various municipalities are forming housing commissions; the Toronto Commission, for instance, has already recommended to the city council that municipal land shall be sold at cost for the purpose of erecting moderate priced houses, these houses to be built immediately by the Commission and sold to the private citizen on a twenty-year instalment plan. War veterans and other citizens, in increasing numbers, are availing themselves of the loan for the purpose of building houses irrespective of those actually being built by the municipal and other commissions. The main effort now being the erection of five or six room houses as "The need is for houses and more houses — now, this year," to quote the editorial comment of a Toronto morning paper in emphasizing the present acute shortage, and this applies not only to Toronto but to smaller municipalities throughout the Dominion.

The construction of some five hundred houses in Ontario has recently been started under the Government Loan, and it is expected that before the close of the summer an additional thousand will be under erection. It is estimated that some $10,500,000 will be loaned to municipalities this year, $5,000,000 of which will be actually expended before the close of the year.



Floor Plan and Alternate Elevations for Six-Room, Semi-Detached House

Progress in Toronto has not been as rapid as might be desired, owing to difficulty in procuring suitable sites, although the Province of Ontario as a whole is further advanced in its housing work than others.*

The loan should help materially the growth of some of the smaller townships and also affect the "back to the land" movement. Many of the returned soldiers are somewhat averse to turning to farming, one of the reasons being that they cannot get decent housing accommodations for their families. They were satisfied more or less before the war, but the horizon of their lives has been broadened since going overseas and standards which seemed all right to them before are not good enough now. The farmer, in other words, will have to supply good housing accommodations if he is to obtain good help.

General Principles and Standards Recommended for Consideration in Provincial Schemes.

Subject to the four requirements set forth in preceding paragraphs, the Federal Government does not impose any conditions in regard to the nature of the scheme or the type and character of the dwellings to be erected, but strongly recommends that in framing schemes, consideration be given to the following matters:

(1) Acquisition of sites, etc.: The success of the housing movement depends upon the acquirement of suitable land at its fair value and at a cost which workingmen can afford to pay. It is essential, therefore, that statutory provision shall be made by the Provinces for a cheap and speedy method of compulsory taking of the land required for housing purposes. To facilitate proper planning and to secure economy in connection with housing schemes comparatively large sites should as a rule be chosen so as to permit of comprehensive treatment. Such sites should be conveniently accessible to places of employment, means of transportation, water supply, sewers and other public utilities.

(2) Planning of sites, etc.: Where housing schemes are proposed, the sites as well as the buildings should be properly planned so as to secure sanitary conditions, wholesome environment and the utmost economy. The land should be sold under building restrictions that will ensure its use for residential purposes only, and should it thereafter be desired to utilize any of the lots so sold for stores or other business purposes, the increased value for such business sites should be made available for public purposes in connection with each scheme.

(3) Loans for separate or individuals' houses: In those cases where loans are given to workingmen owning lots, care should be taken to ensure that the site proposed to be built upon occupies a healthy and convenient situation, and that suitable provision can be made in such situation for the erection of a sanitary type of dwelling with adequate provision for open spaces.

(4) Limit of income of persons to be provided with dwellings: In order to ensure that the money shall be loaned to those who most need it, no person in receipt of an income exceeding $3,000 per annum should be eligible as a purchaser or tenant of a house erected with the aid of Government funds in any schemes carried out by Provincial Governments, Municipalities, Housing Associations or owners of lots.

(5) Construction of local improvements to precede occupation of dwellings: In cities and towns, local improvements, comprising necessary sewers, pavements, sidewalks, water-mains and lighting services, should be constructed as far as practicable prior to or simultaneously with the building of houses, and no house should be permitted to be occupied until provided with proper means of drainage and means of sewage disposal and an adequate supply of pure water.

(6) Reservation of sites for playgrounds, etc.: In all new housing schemes, provision should be made for reserving at least one-tenth of the total area of land being developed for building purposes, as open space for playgrounds, etc., and also for reserving suitable sites for such institutes, public buildings and stores as may be required.

(7) Loans to be used for purchasing and developing land and erecting buildings: Advances should be made for: (*a*) The purchase of suitable land for housing schemes; (*b*) the construction of the necessary local improvements on and in connection with the development of such land as part of a housing scheme; (*c*) the erection of sanitary and economical dwellings.

(8) Proportion of cost of land to dwelling: The proportion of the money lent in respect of the capital value of the bare land (*i.e.*, irrespective of all local improvements or other public services provided to adapt the site for building purposes) should not as a rule exceed one-tenth, and in no case should exceed one-eighth of the above gross cost of the dwelling. In computing the value of the bare land under this clause, the cost of such improvements as have been made should be deducted. For instance, the sum of $3,000 might be lent in the following proportions:

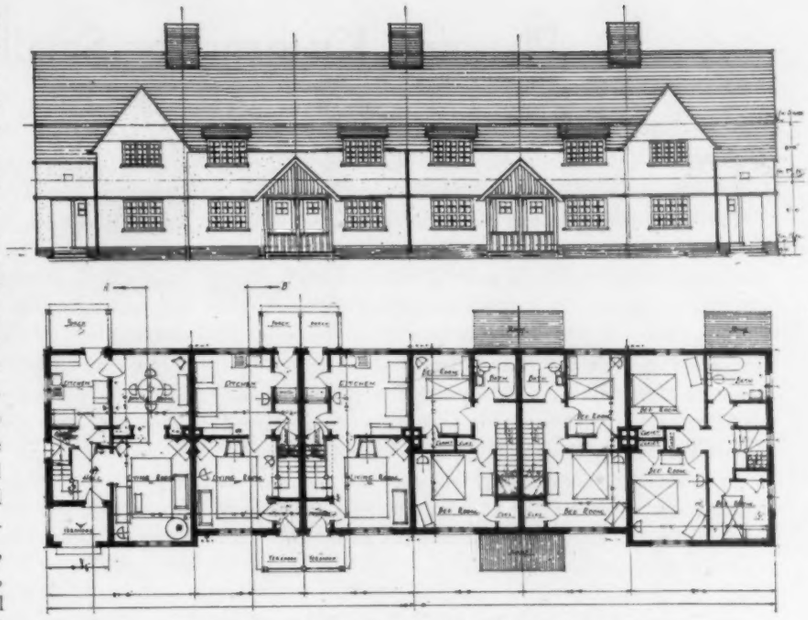
Cost of dwelling	$2,400
Cost of land	300
Capital cost of local improvements	300
	$3,000

If the value of the bare land is estimated to exceed one-tenth ($300 in this case), the extra cost should be met by the owner.

(9) Recommendations as to minimum standards in regard to sites: (*a*) Streets; all dwellings erected in cities and towns should face on streets so constructed as to provide dry and convenient means of access to such dwellings, or on approved courts opening on to such streets and in no case on lanes or alleys. (*b*)

* The designs illustrated herewith are selected from a number suggested by the Ontario Housing Committee. They were prepared under the supervision of the Committee by H. R. Dowswell, A.R.I.B.A., co-operating with the firm of Banigan, Mathers & Thompson. In the preparation of the housing standards the Committee was assisted by a committee of the Ontario Association of Architects.

Sanitary provisions: In cities and large towns, sewers and water-mains should be provided to enable connections to be made as buildings are erected; and in small towns, villages and rural areas where no sewers exist, there should be proper sanitary provision for sewage disposal, to the satisfaction of the Board of Health or Sanitary Engineer of the Province. (*c*) Water supply: All dwellings should have connected to them an adequate supply of pure water before occupation is permitted for purposes of habitation. (*d*) Drainage on sites: No building should be erected on a site which shall not have been drained of surface water, or which shall have been filled up with any material impregnated with fæcal matter, or with animal or vegetable matter, unless and until such matter shall have been removed, and the ground surface under such building shall be properly asphalted or covered with concrete or other dry and hard material to a thickness of 6 inches at least.



Floor Plan and Elevation for Six-Family Group House

(10) Recommendations as to minimum standards in houses: (*a*) Space around dwellings: Provision should be made for securing ample garden and air space surrounding the dwellings to be erected. In cities and towns each dwelling should occupy a lot comprising at least 1,800 square feet, and, in villages and rural areas, at least 4,500 square feet. Not less than 50 feet of clear open space in depth should be provided at the rear of dwellings and the buildings should not occupy more than 50 per cent of the lot. Spaces between the gable or end walls of adjacent buildings should be provided as follows:

Between all buildings (single or in pairs), the walls of which are built entirely of wood or partly of wood and partly covered with stucco or brick veneer, or between all buildings which are more than two rooms deep and have side windows — 16 feet.

Between buildings, the walls of which are built of brick, brick veneer, stucco, hollow-tile, stone or concrete, with fireproof roofing material, which do not exceed two rooms deep — 9 feet.

Dwellings erected of stucco or frame or brick veneer must be either detached or semi-detached. (See clause (2), maximum cost of dwellings, etc.). In all cases hollow walls should be provided.

(*b*) Sanitary conditions and ventilation: Baths and water closets should be provided in each dwelling, preferably on the bedroom floor. Baths and sinks should have hot and cold water. Water-closets should never open from a room and should have a window opening to the outer air. Basements should not be used for habitation. Every habitable room should have at least one window opening to the outer air. Each room should have a window space of at least one-tenth of the floor area, and cross ventilation should be provided where practicable.

(*c*) Height and sizes of rooms: Rooms should not be less than 8 feet in height on the first floor and 8 feet over two-thirds of the floor area in bedrooms. One living room should not be less than 144 square feet, and two of the bedrooms not less than 130 and 100 square feet, respectively.

(*d*) Height and type of buildings and character of construction: Buildings should not exceed two and one-half stories in height, except in the case of cottage flats which might be permitted to be three stories if constructed of fireproof materials. Houses should have 4, 5 or 6 rooms, and in exceptional cases for large families 7 rooms, excluding bathroom.

(*e*) Conversion of dwellings into stores, etc.: Provision should be made to prevent dwellings being converted into stores or used for any purpose other than a dwelling, except with the authority of the Provincial Government or other suitable authority, and only then on receipt of a petition of two-thirds of the owners and occupiers in the street in which the dwelling is situated. Brick, hollow-tile, stone or concrete should be used as far as practicable, preference being given to those materials that are produced locally.

(11) Legal and other costs: A special scale of legal costs should be fixed so as to reduce the expense of the transfer of land and houses. It would reduce architectural expenses if the Provincial Governments issued a series of model designs of suitable dwellings, with detailed drawings, quantities and estimates.

(12) Compliance with general scheme, etc.: All buildings should be erected in accordance with a general provincial scheme, and in compliance with standard forms of specification and contract, previously approved by the Provincial Government.

Planning Kitchens for Small Houses

By OSCAR V. VATET, ARCHITECT

THERE is no doubt that the housekeeping scheme of our beloved foremothers was a vast improvement over the naïve methods of the original inhabitants. The earlier American was content to crush maize in a stone mortar, carry a gourd of water from the nearest spring, and boil the mush over the same open wood fire which baked the cakes and roasted the venison. In winter these processes, transferred to the interior of the tepee, were attended with a variety of minor inconveniences doubtless accepted philosophically as being of a disciplinary nature and consequently beneficial to the tribe. So far as can be deduced, the Indians made little advance in housekeeping from the date of their Alaskan immigration until the foundation of the Carlisle School.

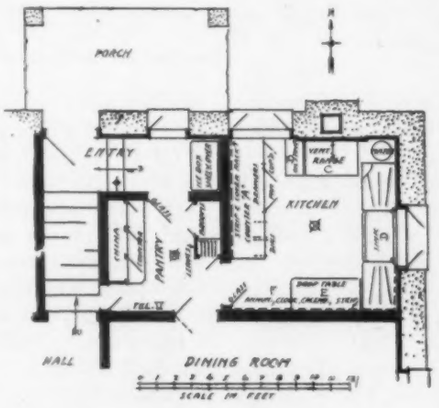
But the beautiful simplicity of Indian methods was not appreciated by our bustling Pilgrim mother. Such ungodly shiftlessness was entirely incomprehensible and quite unsuited to the substantial form of home from which she had been taken. Her cooking was done indoors as soon as ax could fell and hands stack the logs to make cabin and chimney, for she throve in a less smoky atmosphere than that accepted in the best aboriginal practice. She instituted the water barrel and the soap kettle. Her boiling was done on a crane and her roasting on a spit. Bread and cake were baked in an oven tucked into the back of the fireplace. She was occupied from sun-up to sun-down, and her duties were so compelling that she practically lived in the kitchen and as a consequence the kitchen was the living room for the whole family. And what a picture it presented; what richness of ceiling treatment resulted from strings of glossy scarlet and emerald peppers, golden squash and brown gourds, hams, bacon and aromatic yarbs hanging overhead; the big wheel whirling, the roast sizzling in the great, glowing fireplace, and a pile of brown, crusty loaves newly drawn from the oven!

The household function of manufacture was so essentially the great concern for the women that it established the entire program for lives in which "society" occupied a very small place. An uncomplex social schedule permitted great simplicity in the arrangement of the house; the center of the plan was the kitchen and all other portions were subordinate to it.

So it was in the North. In the South a variation in factors wrought somewhat different results. Slave labor and the milder climate resulted in the detachment of various manufacturing departments from one another and from the main house, and there developed such extensive domestic "plants" as that of Mrs. Washington's at Mount Vernon.

* * * * * * *

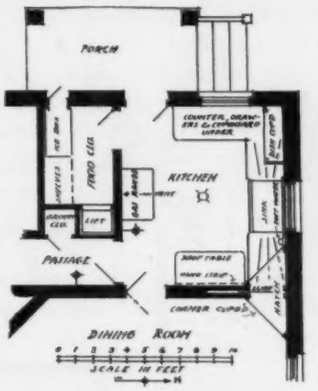
It is not long in years since these conditions prevailed, but in point of progress and in change of customs and manner of living it is a cycle. The introduction of coal, the harnessing of steam and the piping of water led to the development of steam-power factories and gave a great impetus to the invention of machinery. The subdivision of labor and specialization in the wholesale production of household necessities resulted in a decline in home manufacture that gradually released the housekeeper and her female relatives from the kitchen. As ready made supplies became more numerous, the household crafts decayed faster and faster; as a more complex social life developed, the mistress and her relatives withdrew from the kitchen, and it slowly sank in importance to become the obscure dominion of hired help whose intelligence demanded little in the way of efficiency or comfort. Homes were slow to reflect the economic revolution; habit continued to design the kitchen as large as the old living room, but without its former claims to precedence in importance. Unimaginative iron ranges, succeeding the living room open fire, were jammed into a sort of fireplace of painted brick; greasy iron and soapstone tubs and sinks were located inaccessibly amidst the shadows out of deference to the limitations of the feeble plumbing system, which was periodically on the verge of nervous collapse. Kitchen fauna were sympathetically provided with congenial habitats of centerbeaded ceiling-board wainscots and splash backs. There was no special concern about light nor air nor saving of steps nor convenience of working. Numerous narrow lofty doors divided the



Plan No. I

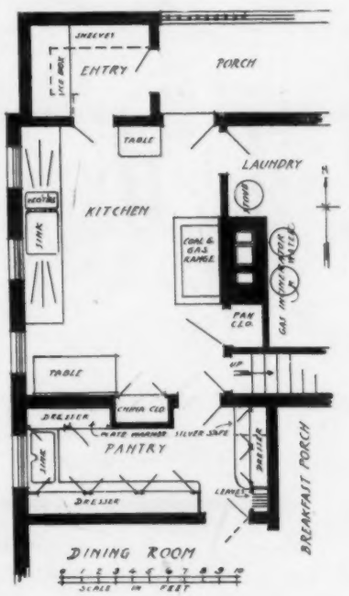
green painted walls and revealed cavernous pan and food closets and mysterious passages to obscurity. The word "efficiency" had not yet run its short, swift race. The degradation of the kitchen was complete; the old time cheerful, savory, bustling center of home life had reached its nadir as a darksome haunt of hired "furriners" and native pestilential bugs.

This depressing picture might hold good to-day but for a further turn of the economic wheel, which brought an urgent need for the adaptation of home arrangements to a scheme of servantless living. The better kind of apartment house plan, jealous of high priced square feet, led the way in kitchen improvement, and there evolved for this type of wholesale home the well arranged kitchenette — a diminutive household workroom intended for just one purpose, — the preparation of food. Quantities of food came ready to serve, some half ready and a little in a raw state. There was no manufacturing to do but to render these materials edible, so the kitchen was resolved into a food laboratory, equipped with heat, water, refrigerator and storage space.



Plan No. II

This type of kitchen came to be recognized as specially successful in bridging distressful periods of maidlessness and was adopted with obviously a greater chance for usefulness for the detached house. When the speculative builder gave the matter any thought at all, he combined sink, range and cupboard according to his Scandinavian folk habits, and the result did not exactly fit American conditions. But when the stimulating hand of personal experience drew the attention of many a young architect to conditions behind the double swing doors, the needed impulse was obtained and this humble but worthy domain began to receive its share of competent attention in the planning of the house.



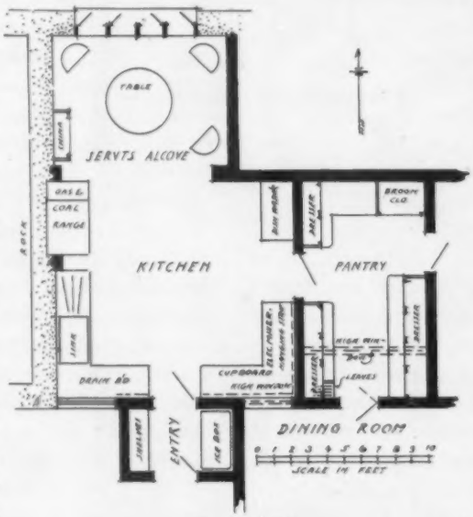
Plan No. III

Please note the difference in principle between the successful old time kitchen and the successful modern kitchen: the former was a factory whose operatives were all the females of the family and whose function was the preparation of an endless variety of finished household products from the raw materials; the latter is a laboratory for the preparation of food only, by one or a couple of more or less skilled food scientists.

The ideal kitchen arrangement will probably never exist for various reasons, such as unalterable personal prejudices of clients, the necessity for deferring to the more conspicuous rooms of the plan, the exigencies of site and orientation, etc. Through a fortunate absence of such obstructions, however, a reasonably close approach to the writer's ideal was possible in Plan I, necessarily within the limits of a very low cost. In this plan are found basic elements which, applied to the smallest possible practical complete kitchen, may apply and develop along obvious lines according to the requirements of more extensive households, as indicated in the references which follow. The plans accompanying these notes are intended to illustrate particular features; for the reasons mentioned above, they differ in varying degrees from the ideal arrangement. In examining any plan for a feature indicated it would be well to compare the other plans as to the same detail. The various features of the plans are not described in great detail, as the scope of these notes is purposely limited to a recital of *principles* only.

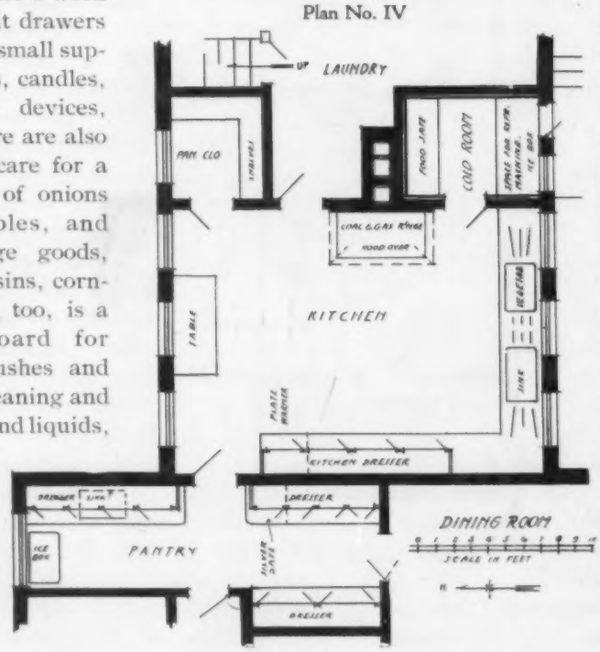
Naturally, the first principle to be observed is that of a convenient and adequate reception of supplies. In Plans I, III and V note how the so-called entry fills this function. Market perishables are unloaded from grocers' and butchers' baskets into the ice box, and the dry stores, such as canned goods, soap, candles, cleansing powders, etc., are placed on shelves above or near the ice box for further distribution or for storage. Here, too, is a screened meat-safe, where cooked food is protected while cooling before placing in the ice box. A second principle is herein observed in thus locating the ice box in that it is accessible for icing and also accessible from the kitchen, yet it is thoroughly guarded from the kitchen heat which otherwise creeps into hastily opened refrigerator doors and through carefully insulated refrigerator walls. No ice man respects a clean floor; the damage done by his careless ways may be minimized by confining him to the

entry — or, better, as in Plan II, excluding him from the house altogether and icing from without directly into the box, which must be specially arranged for that purpose. The ice box becomes dignified in the more extensive Plans V and VI, and by its location in a separate cold room a development may continue indefinitely along lines too obvious to describe.



Plan No. IV

In Plan I the entry opens into the pantry. In any small house the pantry is the storage place for china, glass, silver and table linen: these must be kept out of the kitchen to avoid the greasy dust which pierces glass doors and accumulates on china stored in kitchen cupboards. Of course the servants' china, limited in quantity so as to be cleaned frequently, can be kept in the kitchen, if convenient, as in Plans II and III. A spacious counter shelf provides a work place and beneath it drawers provide storage for small supplies, such as corks, candles, scales, sharpening devices, etc. In Plan I there are also small bins, which care for a small daily supply of onions and root vegetables, and shelves for package goods, such as cereals, raisins, cornstarch, etc. Here, too, is a convenient cupboard for brooms, mops, brushes and vacuum cleaner, cleaning and polishing powders and liquids, and a place for telephone and fire extinguisher, with a special cupboard for table leaves.



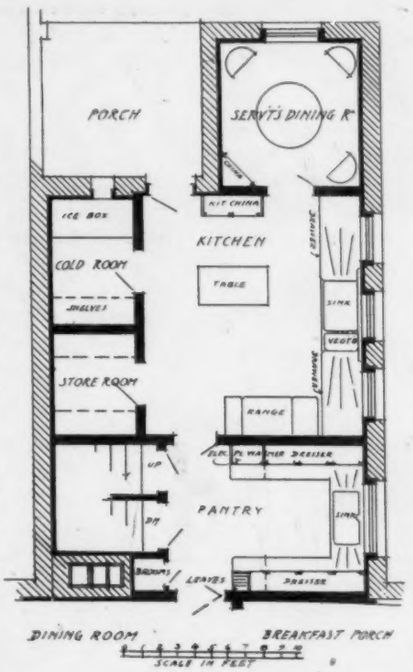
Plan No. V

The dishes thus located in the pantry are equally accessible from the dining room and from the kitchen. In the more extensive plans, pantries are supplied with sheet metal sinks wherein are washed the glass and silver as in Plans III and VI. When plate warmers and silver safes are necessary they, too, may be installed in the pantry, although the former may be found in the kitchen. As in Plan I, an attempt is always made to provide two doors between the kitchen and the remainder of the house as a seal against the spread of smoke and cooking odors; this is a most important feature often overlooked. A checking floor pivot on the double swing dining-room door, which will stand open at 90 degrees, and ordinary hinges on the kitchen door allow of one or both to stand open, if desired, and overcome an objection to two doors sometimes met with. Sometimes a hatch is insisted on, although not usually advisable; a double door arrangement, as in Plan II, treated on the dining-room side as a Colonial corner cupboard, meets the need successfully.

Another most important principle is borrowed from factory practice. It is the minimizing of rehandling materials and a continuity in their progress through the processes of preparation. Strict adherence to this principle would give us as an ideal condition an uninterrupted working plane, which obviously cannot be realized as doors are rather indispensable. In Plan I, however, there is fortunately but one interruption in the plane which extends around the room as follows: Counter "A" is the top of a dresser containing meal bins, drawers for utensils, and cupboards for pots and pans of comparatively infrequent use. Above this dresser is a narrow shelf for condiments, a rack strip for pot covers, and a hanging strip for constantly used cooking utensils. This top is level with the top of the auxiliary oil stove "B," the French range "C," the sink "D" and its drain boards, and the drop table "E." One advantage of an uninterrupted working plane is to permit of plenty of wall space for the hanging strip which carries implements in daily use. The towel rack next the hot water tank is convenient to the sink and allows quick drying. Roller towels, food and coffee grinders, and even pencil sharpener are conveniently located on the walls; drawers for

cook books, string, bills, note pads, etc., and enameled bread and cake boxes, sugar, oil and vinegar are found on counter "A." Annunciator, alarm clock and calendar are in plain sight at "F."

A further important principle observed in this plan is that of avoiding as far as possible legs and supports which run to the floor and obstruct mopping and cleaning; the hot water tank shown is an exception in the plan under consideration, but elsewhere conditions permit the tank to be suspended above the range or in the cellar below or in the adjoining rooms, as in Plan III. Again, for an avoidance of backaches and splashing of aprons, the working plane is raised above the usual height. Although some slight variation might be justified, at least 32 inches from floor to edge of sink is desirable. This height may be achieved by hanging the sink on concealed brackets, by building a course of brick underneath the range and by detailing the counter shelves properly. If the floor is fireproof, as in Plan I, it is wise to omit the hearth. The French coal range—plain, capacious and even tempered—is indispensable in this particular household for its sterling cooking ability; it is also the sole source of hot water. In other plans, water is heated variously by automatic gas heater, by separate coal heater, by capacious laundry stove or by coils in the house heater. In some a combination of two methods is effected by cross-connecting, allowing of either being used at will. In Plan I the oil stove (gas is better when obtainable) is used only for emergencies. In Plan II only a gas range was desired and in others of the plans combination coal and gas ranges are seen. Former objections to the coal range are removed by dumping the ashes directly into a chamber in the base of the chimney, as in Plan I, or into a covered ash can in the cellar, whence they are removed every fortnight or so. The superiority of the coal range over any other cooking device is so generally held by competent judges that the writer believes it wise to provide a suitable flue for one even when the client requires a gas range only.



Plan No. VI

One most important consideration is that of light—plenty of light exactly where needed, light for comfort and efficiency, light as purifier and germicide, light for cleanliness and cheerfulness. There is seldom good reason for insufficient or improper natural lighting; only under the most discouraging conditions should overhead or artificial lighting be relied on. The casement windows shown in Plan I provide ample light where needed and plenty of cross ventilation, and both of these necessities are provided as fully in Plans II and V. Natural ventilation should be positive and insensible; in summer weather large openings are most desirable, a requirement met most completely by casement windows whose heads are flush with the ceiling. Their broad sills are useful and have distinct ornamental possibilities in connection with geraniums and such vanities. In addition to good natural ventilation there is imperatively needed a positive and quick-acting means of removing fat smoke and steam. The not uncommon hood and vent-flue arrangement is not successful unless aided by a power-driven fan—a piece of machinery too troublesome for the households under discussion. The sluggish draft in the vent-flue adjoining the smoke flue, induced by the warmth of the latter, is found principally in the pages of technical fiction; it is very imperceptible in reality and is entirely inadequate to clear the air during a fire of fat or while boiling cabbage, in addition to which the unsightly hood catches dust and obstructs light. A device proven valuable by daily use—simple, clean and almost instantaneous in action—is the tilting iron plate let directly into the *smoke* flue at the ceiling. A blaze in the frying pan or a cloud of black smoke—a pull on the ventilator chain, and the air is clear in a minute.

When only one sink is to serve, it should be large, deep and high. The drain boards must be generously large, well distributed and not pocketed in corners. In Plan III is seen a good type of sink with special compartment for washing vegetables, which operation required a separate sink in Plan V. Plan II is peculiar in that a supply of soft (rain) water was needed in addition to the regular hot and cold. This plan likewise required a lift from the cellar, where a dry storage room was provided because of the necessity for receiving all household supplies in unusually large quantities.

The table in Plan I was hinged to allow of being dropped when more than two persons found it

necessary to work in the kitchen at one time. Notwithstanding the small size of this kitchen, due to the fact that all distances were proportioned to make it a "one-maid kitchen" and to save steps and time, this table has never been dropped, although three persons have worked therein simultaneously and comfortably. This table is also the dining table for the maid; Plan IV shows the next development of this requirement in providing a dining alcove for two servants, which in Plan VI is developed further into a separate dining and sitting room.

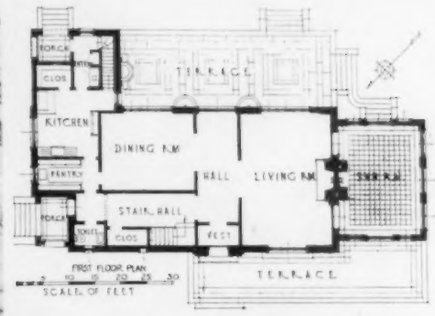
So far we have touched upon only the elements of kitchen arrangement as applied to various executed plans; personal requirements on the part of the various clients and necessary sacrifices of principle to other factors of plan, situation, and to cost have in some of the examples submitted produced results quite different from the ideal. The writer's application of a majority of his principles to his own dwelling (as far as possible within a very moderate cost limit) shown in Plan I has been abundantly justified by the experience of mistress and maids, not to mention visitors who come to sniff and remain to experiment; and while he subscribes heartily to that sound principle which adjusts any treatment according to a careful diagnosis of each separate case, he believes firmly that this laboratory type of kitchen represents the best solution of modern needs, and that a reversion to the old style living-room type occasionally seen is a luxurious affectation unjustified except as a sentimental indulgence.

A few words will suffice for such additional mechanical equipment as must be provided for by the architect.

An incinerating chamber may be built into the chimney. It is fed from the kitchen, using combustible rubbish as fuel and cleaned from the cellar. Plan III shows a gas-burning refuse consumer in the adjoining laundry. Both types have merit. Electric appliances commonly provided for, other than those used on the dining-room table, are not so numerous as they will doubtless become in the future. The electric range is comparatively uncommon, on account of the high cost of operation; its specialization in the form of an insulated electric oven with automatic time and temperature control-devices is a combination of great promise. These apparatuses require no more foresight than convenient space and current. Electric plate warmers require a special circuit and a pilot light; steam plate warmers in small houses are connected to the heating system and are, therefore, cold six months out of twelve, which fact is sometimes overlooked. Both sorts are useful and may be located in the kitchen or the pantry.

In a family of six or less, the mechanical dishwasher is at a disadvantage compared with washing by hand; but in larger families the several electric varieties are time and trouble savers. They require an ordinary electric wall receptacle and are best connected to the hot and cold water supplies and to the waste pipe like any other plumbing fixture. A meritorious household power unit consists of a motor, which operates a revolving chuck; this machine beats, stirs, whips, grinds, buffs and polishes. It requires only a place to stand and a wall or base receptacle for current. The electric refrigerator machine is coming in to its own. There are small household sets which are automatic in action and within reach of many purses. They are inexpensive to run and extremely successful. Ordinarily they are connected to the lighting circuit, water supply and waste line. These comprise the mechanical devices of some merit not uncommonly found, although the list may be longer or shorter, depending on the results of one's experience with them.

One word more regarding the finish and finishing materials of kitchens. The suite shown in Plan I met the basic requirements of cleanliness, durability and cheerfulness in an inexpensive way. The windows have rounded plaster jambs, the door trim and cupboards are cypress, and the counter shelves and drain boards ash. All woodwork is finished in the best of spar varnish. All plaster work of walls and ceiling is enameled with a glossy, leadless enamel. The floor is plastic mineral cement continuous with a rounded base 6 inches high. This material is non-combustible, impervious and durable and has no cracks nor crevices; it is almost as resilient and comfortable to the feet as wood. The range is set against a margin of white enameled brick with rounded edges. In various scales of cost, the above materials may be varied widely; trim and cupboards may be white enameled, either on wood or on steel; counters may be thick polished glass, aluminum, white metal or marble. There is probably more diversity of opinion regarding floor material than any other part of the finish; there are preferences for Portland cement, cemented linoleum, oiled maple or ceramic tile, with possibly a glazed tile wainscot. Sinks may be of tinned copper or other sheet metal, enameled steel or porcelain. But the great desideratum is that all surfaces be non-absorbent, easily cleaned, durable and of attractive appearance; the floors should be, in addition, quiet and "easy on the feet."

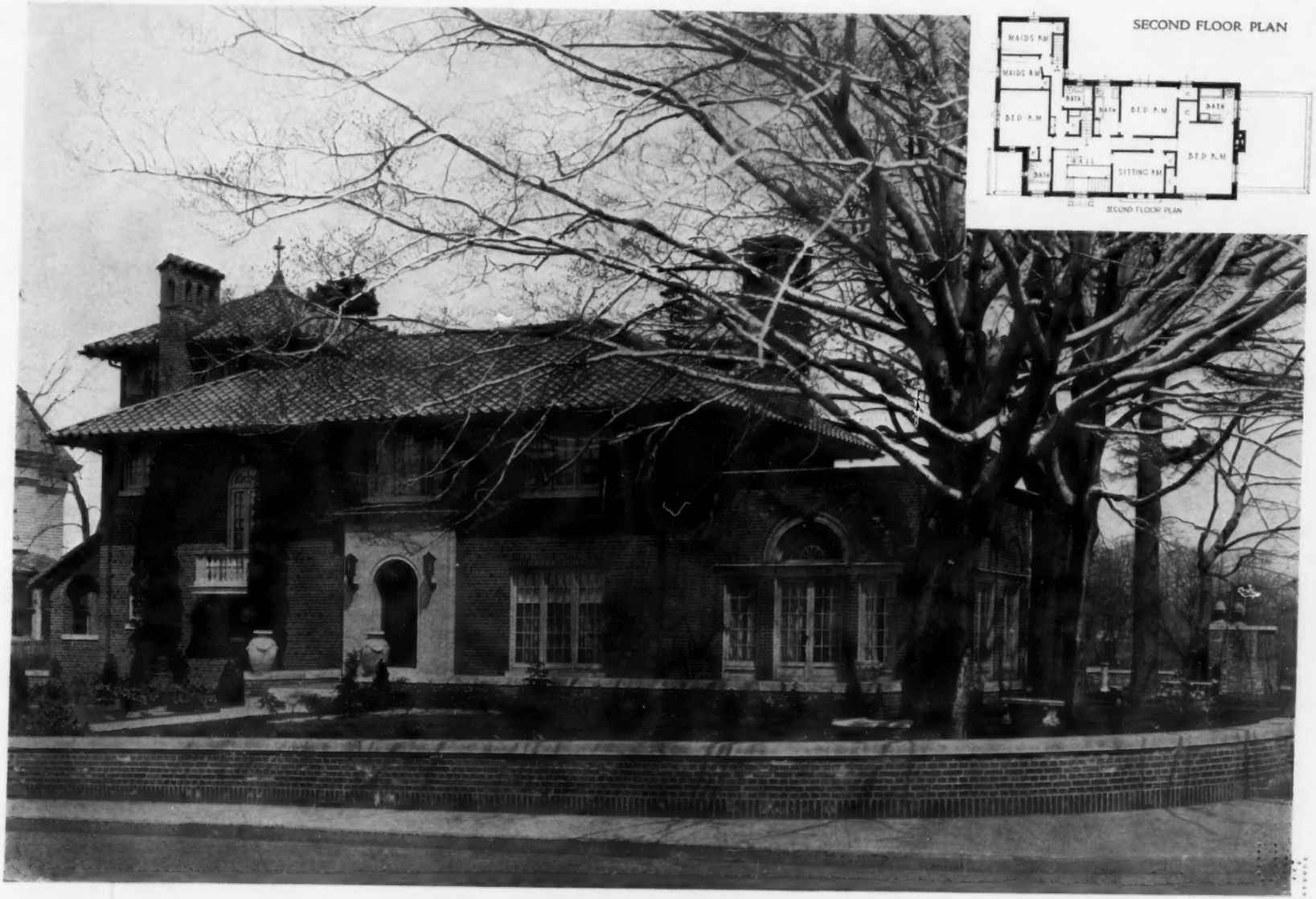


FIRST FLOOR PLAN

DETAIL OF ENTRANCE FACADE

HOUSE OF JAMES C. FRANCESCONI, ESQ., BROOKLYN, N. Y.

SLEE & BRYSON, ARCHITECTS



HOUSE OF JAMES C. FRANCESCONI, ESQ., BROOKLYN, N. Y.

SLEE & BRYSON, ARCHITECTS

HOUSE OF F G. TALLMAN, ESQ., WILMINGTON, DEL.

WILSON EYRE & McILVAINE, ARCHITECTS

VIEW OF GARDEN FRONT ON GARDEN AXIS

VIEW OF GARDEN FRONT LOOKING ALONG PATH

HOUSE OF F G. TALLMAN, ESQ., WILMINGTON, DEL.

WILSON EYRE & McILVAINE, ARCHITECTS

DETAIL OF COURT ON NORTH SIDE

DETAIL OF ENTRANCE LOGGIA

HOUSE OF F. G. TALLMAN, ESQ., WILMINGTON, DEL.

WILSON EYRE & McILVAINE, ARCHITECTS

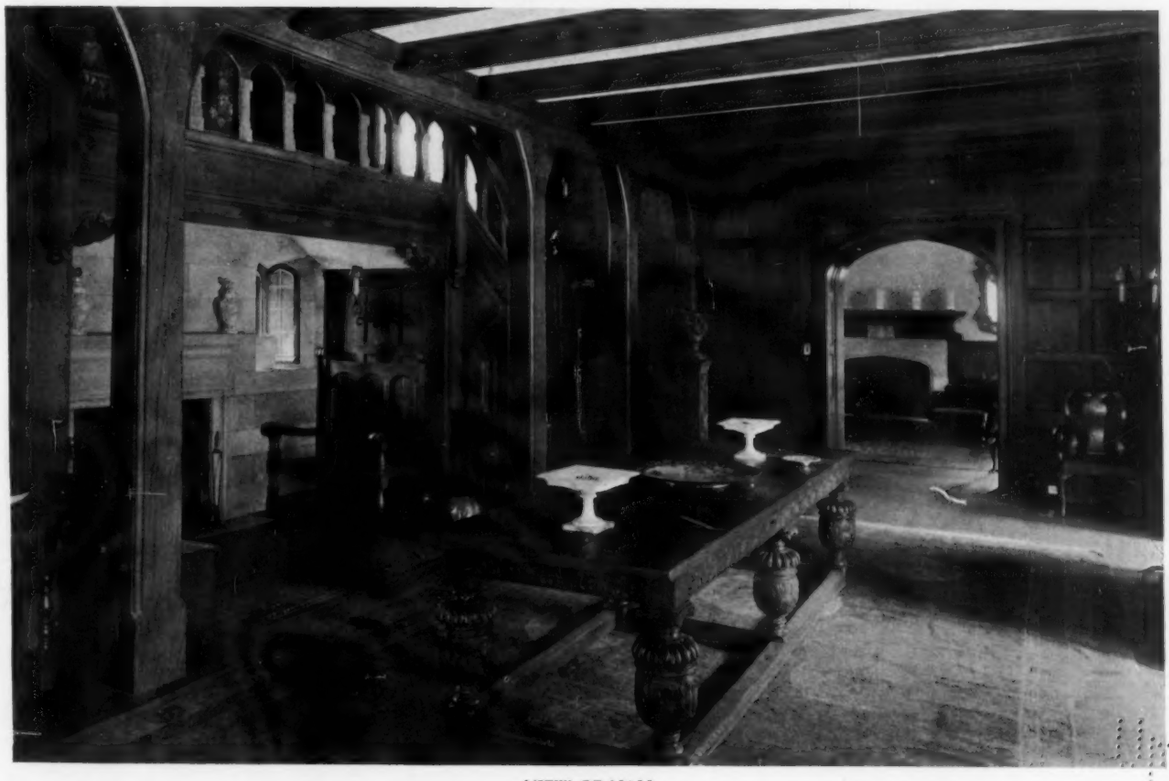
VIEW OF LIVING ROOM

VIEW OF LIBRARY

HOUSE OF F G. TALLMAN, ESQ., WILMINGTON, DEL.

WILSON EYRE & McILVAINE, ARCHITECTS

VIEW OF DINING ROOM

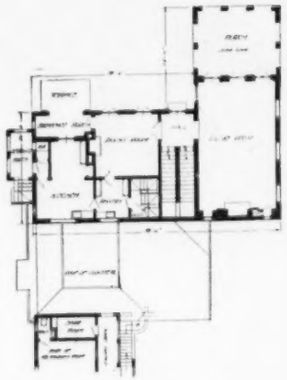


VIEW OF HALL

HOUSE OF F. G. TALLMAN, ESQ., WILMINGTON, DEL.

WILSON EYRE & McILVAINE, ARCHITECTS

SECOND FLOOR PLAN



FIRST FLOOR PLAN

BASEMENT FLOOR PLAN

HOUSE OF W. F. PAYSON, ESQ., DARIEN, CONN.

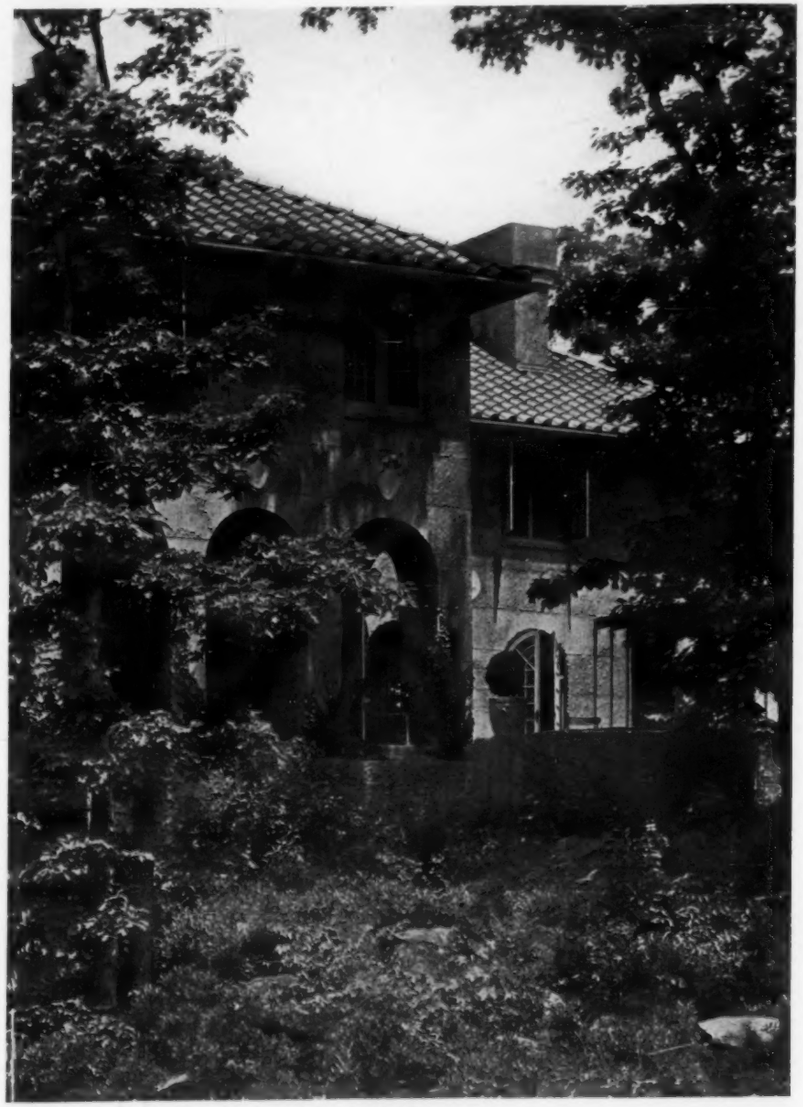
HOWARD GREENLEY, ARCHITECT

GENERAL VIEW FROM THE SOUTH

DETAIL VIEW OF SOUTH TERRACE

HOUSE OF W. F. PAYSON, ESQ., DARIEN, CONN.

HOWARD GREENLEY, ARCHITECT



DETAIL OF SOUTH FACADE

DETAIL OF ENTRANCE TO COURT

HOUSE OF W. F. PAYSON, ESQ., DARIEN, CONN.

HOWARD GREENLEY, ARCHITECT

HOUSE OF E. H. ELLISON, ESQ., NEWTON, MASS.

KILHAM & HOPKINS, ARCHITECTS

DETAIL OF ENTRANCE FACADE

FIRST FLOOR PLAN

SECOND FLOOR PLAN

HOUSE OF E. H. ELLISON, ESQ., NEWTON, MASS.

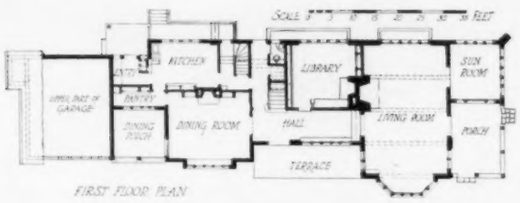
KILHAM & HOPKINS, ARCHITECTS

VIEW OF GARDEN SIDE

VIEW OF MAIN HALL

HOUSE OF E. H. ELLISON, ESQ., NEWTON, MASS.

KILHAM & HOPKINS, ARCHITECTS

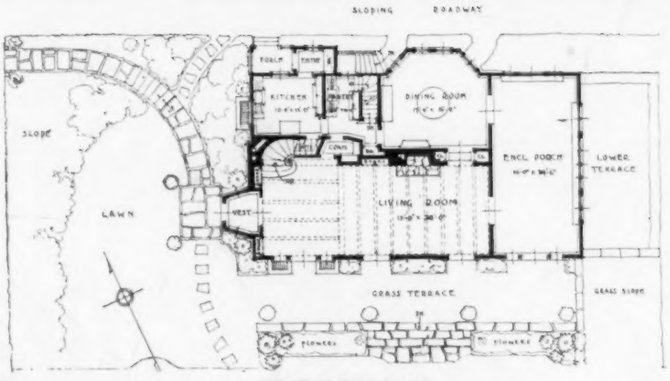


FIRST FLOOR PLAN

SECOND FLOOR PLAN

HOUSE OF DR. CURTIS GINN, DAYTON, OHIO

LOUIS LOTT, ARCHITECT



FIRST FLOOR PLAN

SECOND FLOOR PLAN

HOUSE OF FRANCIS A. NELSON, ESQ., UPPER MONTCLAIR, N. J.

FRANCIS A. NELSON, ARCHITECT

VIEW FROM ENTRANCE PATH

DETAIL OF TERRACE SIDE

HOUSE OF FRANCIS A. NELSON, ESQ., UPPER MONTCLAIR, N. J.

FRANCIS A. NELSON, ARCHITECT

Three Recent Conventions of Interest to Architects

By D. KNICKERBACKER BOYD, F.A.I.A.

At these three conventions held in Atlantic City during the closing days of June, many reports were presented, addresses given and discussions held that have undoubted interest to individual architects and to the profession at large, and it is hoped that the brief summary of events that follows will sufficiently cover the ground to enable readers to single out points of value on which they may individually wish to secure detailed information. — EDITOR.

12TH ANNUAL CONVENTION NATIONAL ASSOCIATION OF REAL ESTATE BOARDS

THIS convention lasted four days and those sessions at which the writer was present were attended by what appeared to be over a thousand persons — all intensely interested in the many matters constantly unfolding themselves in accordance with a completely arranged program.

In addition to the features which one would expect to find included, such as the development of land subdivisions, returns on land investments, agency contracts, licensing, taxation and other real estate problems, standardized appraisals were discussed and every phase of the Own Your Own Home Campaign was considered.

"The Building and Management of Apartments at High Level War Prices," bringing out a spirited discussion that lasted nearly two hours, was read by Harry Wardman of Washington.

A matter of exceeding interest to architects as well as other citizens and one of significance to be taken up by real estate interests was covered by the address of Everett L. Millard, President of the Municipal Art League of Chicago, on "What Realtors Can Do to Abate the Sign Board Nuisance." In this a new avenue of approach was suggested by Mr. Millard for minimizing the public nuisance of the outdoor billboard.

He stated that the matter of these disfigurements was not merely an æsthetic one, but that in practically every large city these purveyors of information to an unwilling public very seriously affected private real estate values and net return, and also detracted heavily from the value to the people of municipal investments in parks and boulevards. There was not a dissenting voice when this subject was put to vote, and the meeting unanimously indorsed the proposal to create a National Committee of the Association for warfare against the systematic defacement of property.

The whole morning of the third day was given over to a conference on housing, the session being opened by reading a letter from Louis A. Moses of Cleveland, Chairman, in lieu of a report of the Committee on Housing. This letter presented for action the suggestion that the fundamental need is for legislation by Congress, giving proper recognition to real estate securities and home ownership.

The reading of this letter was followed by the addresses of Wm. E. Shannon, Washington, Ex-Manager Real Estate and Commandeering Division, U. S. Housing Corporation, on "Some Observations in Government Housing, Abroad and at Home," and of B. J. Treacy, Manager, Real Estate Division, U. S. Housing Corporation, on "Some Present Real Estate Problems of the U. S. Housing Corporation."

The Committee on Resolutions presented resolutions which were acted upon, indorsing a national system of highways, calling upon the Government to dispose immediately of all dwellings built by the Government during the emergency and stress of the great war on the best terms and prices obtainable and terminate any Government activities in building or owning homes.

The Committee called special attention to Senate Bill 1469 known as the Calder Bill, a bill to create a Federal Home Loan Board and Home Loan Banks for the purpose of aiding in financing the construction of homes, and recommended, in view of its importance, that a special committee be appointed to study this measure and work in conjunction with the Legislative Committee.

The Resolutions Committee also recommended referring to the same special committee several resolutions to the following effect:

"Deploring as indications of national decadence the gradual increase in tenantry throughout the United States (estimated by some at the rate of 3 per cent each ten years), together with the falling off in native birth rate (estimated in one of our important states at 40 per cent in ten years), there is viewed with gravest concern the cumulative shortage of homes, housing and building, occurring as it has simultaneously with the transfer of capital for building purposes to the field of short time loans.

"The Association believes that local standing committees should at once be appointed and be especially charged with creating a widespread popular understanding of the actual present conditions as well as the consequence of drifting.

"Such local standing committees should be points of contact with the Government and with the committees of the Y. M. C. A., building and loan associations, National Federation of Building Industries, and other trade and civic organizations.

"Such standing committees should co-operate with the Department of Labor, the American Federation of Labor, the American Institute of Architects, the Engineering Council and other organizations in order that the Board of Jurisdictional Awards may promptly and impartially bring about adjustment of jurisdictional controversies.

"Such standing committees should co-operate with the committees of the American Institute of Architects, the National Federation of Building Industries, the American Society for Testing Materials, etc., in order to bring into more general and popular use standard materials and sizes, and thus decrease the cost of building without decreasing its durability."

The Secretary of the National Association of Real Estate Boards is Tom Ingersoll, Andrus Building, Minneapolis, Minn.

22D ANNUAL MEETING AMERICAN SOCIETY FOR TESTING MATERIALS

THE four day and evening sessions were held beginning June 24, 1919, the last night being the joint session, with American Concrete Institute on cement and concrete.

While the program was made up of many reports of important committees and of papers dealing with scientific subjects and technical matters, not relating directly to building construction, one or more of these reports or papers at each session dealt with structural materials having a close bearing upon the practice of architecture. Among these, listed in order of presentation (and numbered accordingly), might be cited the following:

8. Committee D-1: On Preservative Coatings for Structural Materials. P. H. Walker, Chairman.
9. Paint, a Plastic Material and Not a Viscous Liquid. E. C. Bingham and Henry Green.
13. Annual Address by the President, Guilliam H. Clamer: "Standardization."
14. Committee A-1: On Steel. J. A. Capp, Chairman.
15. Committee A-2: On Wrought Iron. H. E. Smith, Chairman.
19. Committee A-5: On Corrosion of Iron and Steel. S. S. Voorhees, Chairman.
20. The Influence of Very Low Percentages of Copper in Retarding the Corrosion of Steel. D. M. Buck.
22. Committee E-1: On Methods of Testing. G. Lanza, Chairman.
33. Committee B-2: On Non-Ferrous Metals and Alloys. William Campbell, Chairman.
36. Committee C-3: On Brick. Edward Orton, Jr., Chairman.
37. Committee C-6: On Drain Tile. A. Marston, Chairman.
40. Committee C-7: On Lime. D. Knickerbacker Boyd, Chairman.
43. Committee C-2: On Reinforced Concrete. Richard L. Humphrey, Chairman.
44. Committee C-4: On Clay and Cement Sewer Pipe. R. Hering, Chairman.
45. Committee C-11: On Gypsum. R. J. Wig, Chairman.
50. Committee C-1: On Cement. R. S. Greenman, Chairman.
51. Committee C-9: On Concrete and Concrete Aggregates. S. E. Thompson, Chairman.

Discussions following these papers were enlightening, but in them the voice of the architectural profession was unusually silent. These matters of so much moment to it were presented, discussed and adopted without the active participation of the profession largely concerned and assisted. When individual service and interest combined with official representation and attendance would so readily discharge a reciprocal obligation, should it not be forthcoming?

The writer, as chairman of the Institute's Committee on Basic Building Code, discussed with members of the Executive Committee of the A. S. T. M. the possibility of co-operation between the Institute and the Society. It was pointed out by these representatives of the Society that its contribution toward a Basic Building Code could only be the opportunity afforded, by the formulation of its standards, for their incorporation into a national code, as has already been done with municipal codes. That the activities of the Society had always been open to participation by architects in the formation of these standards was also pointed out, and that they had singularly failed to make their especial knowledge, their skill and the results of their experience available to the Society through service on its committees, concerned with structural matters, was to be conceded.

On the basis that the real means of co-operation between these important organizations lies in co-operative service for the common good, the writer desires to lay before each chapter of the Institute the suggestion that as many of the chapters as are able, interested and willing shall join the Society and designate one of its members to assume committee service, receive the Society's literature, and make known to Chapter members the results of the Society's contributions toward the solution of practical problems affecting the practice of architecture.

This brief account cannot go into details of the reports and papers submitted further than to indicate, by reference to two or three of them, the value of the material to be found in the others. It is well to point out that members receive volumes containing everything including discussions, and that those not members may secure copies of separate reports and papers from the Secretary of the Society at a very nominal price.

The report of Committee A-5 on Corrosion of Iron and Steel embraced sixty-four pages of text, tables and illustrations, all relating to this most

important factor in building construction. Results are given of the continued inspection of sheets of base metal exposed at Fort Sheridan, Ill., Pittsburgh, Pa., and Annapolis, Md., all of varying metal content, including some with copper mixtures. This latter treatment of steel was also covered in the paper on the "Influence of Very Low Percentage of Copper in Retarding the Corrosion of Steel," the conclusions differing apparently in accordance with the locality in which the tests were made.

This work taken in connection with that of Committee D-1 on Preservative Coatings for Structural Materials should be followed by architects and others interested in the various stages of progress pending final developments and conclusions. Any enlightening instances coming under observation in practice, especially in demolition of old structures, should be communicated to these Committees.

The report of Committee C-3 on Brick, which was adopted, fixed a definite initial standard of size for building brick. This is 2¼ by 3⅞ by 8 inches, which it is assumed will now replace former standards and be followed as fast as manufacturing conditions permit. It also now sets a definite method and value for testing brick and classifying them according to absorption limits and compressive strength as follows:

Grade of Brick	Absorption Limits Per Cent		Compressive Strength (on edge), Pound per Sq. In.		Modulus of Rupture, Pound per Sq. In.	
	Mean of 5 Tests	Individual Maximum	Mean of 5 Tests	Individual Minimum	Mean of 5 Tests	Individual Minimum
Vitrified	5 or less	6.0	5000 or over	4000	1200 or over	800
Hard	5 to 12	15.0	3500 or over	2500	600 or over	400
Medium	12 to 20	24.0	2000 or over	1500	450 or over	300
Soft	20 or over	No Limit	1000 or over	800	300 or over	200

The standing of any set of bricks shall be determined by that one of the three requirements in which it is the lowest.

Committee C-7 on Lime reported in addition to the results of an active year, that it had secured the building codes of the U. S. and was working upon specifications for plastering for later submission to the Society.

Committee C-2 on Reinforced Concrete reported that inasmuch as the preparation of standards for this type of construction involved engineering design, it recommended that the co-operation of the bodies comprising the "Joint Committee" be sought in establishing complete standards. These bodies are: American Society of Civil Engineers, American Railway Engineering Associations, American Society for Testing Materials, Portland Cement Association and American Concrete Institute.

The writer raises the query: Are there not in the American Institute of Architects enough members familiar with the use of this important material in its application to modern structures to warrant the inclusion in the above group of the American Institute of Architects?

The Secretary of the American Society for Testing Materials is C. L. Warwick, University of Pennsylvania, Philadelphia.

15TH ANNUAL CONVENTION AMERICAN CONCRETE INSTITUTE

THIS meeting lasted two days, — June 27 and 28, — the first of which coincided with the last day of the A. S. T. M. Convention.

The following reports and papers are listed as those having especial significance to architects:

Committee on Treatment of Concrete Surfaces — J. C. Pearson, Chairman.

Investigation into the Economic Possibilities of Light Weight Aggregate in Building Construction — A. W. Stephens.

Committee on Reinforced Concrete and Building Law — E. J. Moore, Chairman.

Sub-Committee on Regulation for Strength Tests of Floors.

Committee on Reinforced Concrete Highway Bridges and Culverts — A. B. Cohen, Chairman.

Committee on Building Blocks and Cement Products — R. K. Havlik, Chairman.

Committee on Concrete Roads and Pavements — H. E. Breed, Chairman.

Fuel Oil Tanks — H. B. Andrews, H. E. Walton, J. C. Pearson and G. E. Smith.

Committee on Concrete Sidewalks and Floors — J. E. Freeman, Chairman.

Committee on Nomenclature — W. A. Slater, Chairman.

Report of Committee on Fireproofing — W. A. Hull, Chairman.

Paper — Fire Tests of Concrete Columns — W. A. Hull.

In the order of presentation as above given, and perhaps of the most general interest as a complete document of conclusions and recommendations, comes the report on *Treatment of Concrete Surfaces*, which as a matter of fact is this year completely devoted to *cement stucco*.

Every architect should put himself in possession of the report of this committee. A great proportion of its fifteen pages is given over, as very properly it should be, to discussion and recommendations concerning the background to receive stucco and to features of design. While it is to be remembered that the subject of this report is cement stucco, and not lime stucco (the terms here apply to the predominance of the material used), the sections relating to design, structure, masonry walls, frame walls and materials would largely apply with equal force to the use of either kind of stucco coating. No better idea of the nature of this document can be obtained than quoting from

the Report which as adopted becomes "Recommended Practice for Portland Cement Stucco to Supersede the Present Standard Specification."

"One of the fundamental considerations in successful stucco work is a suitable design of the structure for stucco. The architect does not always realize that an exterior plaster of any kind merits whatever protection can legitimately be given it; that for the sake of appearance it needs more protection against leakage and drip than brick, stone or even wood exteriors. Thus it must be recognized that stuccoed copings, cornices and horizontal or nearly horizontal surfaces are more exposed to deterioration than vertical surfaces; that attention to details of chimneys, down spouts, gutters, window sills and overhead flashings will avoid much unnecessary staining and unsightly cracking."

The report of the Committee on *Reinforced Concrete and Building Laws* was also of special interest and timeliness. It consisted in the offering of "Proposed Standard Building Regulations for the Use of Reinforced Concrete." These elicited much discussion and in view of the action taken by the A. S. T. M. with respect to the report of its Committee on Reinforced Concrete, namely, to arrange for joint conference with other bodies, this report of the A. C. I. was received and ordered printed for reference and study.

The report of the Committee on *Fireproofing* and the paper on Fire Tests of Concrete Columns consisted of accounts of the series of fire tests made by the Bureau of Standards on over fifty full size concrete columns, as supplementing the tests being made at the Underwriter's Laboratories in co-operation with the Associated Factory Mutual Fire Insurance Companies and the Bureau of Standards. The report concluded thus:

The following recommendations are made, pending further developments:

1. That for fire-resistive construction, limestone, trap rock, blast furnace, slag and burned clay be given a preference over highly silicious gravels.

2. That in cases where gravel aggregate is to be used with no additional protective material over the concrete, round columns be given a preference over rectangular ones.

3. That where gravel aggregate is used all columns, but especially rectangular columns and round columns with spiral reinforcement, be given the additional protection of approximately one inch of Portland cement plaster either on metal lath or reinforced by light expanded metal.

Mr. Hull's paper contained the following conclusions:

"The results reported at this time afford additional evidence in support of the conclusions reached last year, especially as to the important differences in the fire-resistive properties of concretes from different aggregates. The results of tests of gravel concrete columns are consistent with those of last year, and the conclusion that gravel concretes from gravels of a number of different types are inferior, in point of fire resistance, to concretes from a number of other aggregates, is obvious and unavoidable. Due to differences in age and possible differences in conditions of aging, the results shown by the trap rock and the slag concrete columns are not strictly comparable with those of the tests of limestone columns previously reported. The observation that neither the trap rock nor the slag concrete appears to have any tendency to spall or any other malignant tendency under the conditions of these tests is important and reassuring.

"Conclusions as to possible methods for providing satisfactory protection for gravel concrete columns can be made more satisfactory in a later report, after additional work has been done along this line."

The Committee on *Sidewalks and Floors*, which last year recommended the elimination of cinder or other fills under sidewalks, this year submitted merely some few changes in the former Proposed Revised Specifications and reported this item of interest:

"Plans are nearly complete for the series of wear tests of concrete floor mixtures and methods of finishing, mentioned in last year's report, to be undertaken at the Structural Materials Research Laboratory at Lewis Institute, Chicago. These tests will cover a wide range of mixtures, sizes of aggregates and consistencies, besides those commonly employed in concrete floor construction, and the wear tests will be made with the Talbot-Jones rattler which has been used for similar tests covering concrete road construction. The results of this investigation, together with those of service tests now being made at the Bureau of Standards on a number of methods of floor surface treatment, should provide valuable material for a report on the wearing resistance of concrete floor surfaces, the treatment of unsatisfactory floors and methods of securing the best results."

The present and former reports of the Committee on *Concrete Roads and Pavements* should be read for valuable data on the size of turns for automobiles, radius and camber of roads, construction drainage and other features.

The series of papers on *Fuel Oil Tanks* contributed much information on the subject of design, construction and characteristics of concrete containers in general.

The Secretary of the American Concrete Institute is H. B. Alvord, 27 School St., Boston, Mass.

ARCHITECTURAL AND BUILDING ECONOMICS DEPARTMENT

C. STANLEY TAYLOR, ASSOCIATE EDITOR

A Time for Leeway in Specifications

THE uncertain character of the material market at present calls for particularly careful study in the writing of specifications. The architect must realize the problems of the builder in getting materials of certain kinds—a problem affected by high local cost, uncertainty and difficulty of delivery, and in many cases the fact that specific brands or types cannot be had at any cost.

Price quotations are not dependable or binding and there is a vast difference in actual purchase cost of materials as compared to general cost estimates. To hold down material bills to-day requires all the skill and buying knowledge of experienced builders.

In consequence the materials buyer should not be held to rigid specifications—not even to types of roofing, siding or to certain specified kinds of lumber, brick or tile. It is better now to write specifications in a sufficiently broad manner that every advantage may be taken of a market fluctuating both in price and ability to deliver.

In many instances it will be found that local material market conditions will influence æsthetic elements of design involving material colors and textures, and that the artistic sense of the designer must be subject to the elements of material cost and time of delivery. This is particularly true in the case of medium cost dwelling construction.

Another important element which should influence both design and specification writing is the question of local labor conditions. In certain localities it will be found that there is a dearth of carpenters but that mason labor is readily available. This leads to serious consideration as to the advisability of building of frame construction when a saving of time and money through the employment of masons is evident, provided plans call for a masonry building.

At other points a reverse condition will be found and it is evident that a study of local labor conditions and the material market for deliveries is now called for before final plans are made. Specifications should be written broadly enough to take the best advantage of all conditions.

The Need for Practical Garage Design

MILLIONS of dollars are being spent at the present time in the expansion of the automobile manufacturing business. In and near Detroit, plant extensions and new manufacturing units are being erected to meet an enormous demand for motor-driven vehicles. At the present time it is estimated that nearly one and a quarter million new machines are needed annually to offset depreciation and to replace automobiles which are scrapped.

The public garage and repair and accessory business is entering a period of great activity, presaging a demand for service buildings in every part of the country.

The design of the average public and even private garage is entirely inadequate and far from efficient. Very few architects have any definite conception of the practical requirements of such buildings. In fact, very few owners know exactly what they need.

It is interesting to realize that of all classes of business the success of the public garage and service building probably depends to a greater extent than any other on the practical design and arrangement of the building.

Owing to the character of the business, which is not usually successful if carried on in a very small way, the investment in service buildings varies from $25,000 to sums ranging in six figures.

Here is one opportunity which may be taken advantage of by many architects. The general lack of knowledge on the subject, even on the part of owners, is evidenced by the fact that for several years the automobile journal having the greatest circulation among garage owners and dealers has carried on in its service department a garage design advisory division. Hundreds of garages have been built through this service, which is far from complete from the architectural viewpoint, and many garages have been placed on a paying basis through recommended structural changes.

It would seem advisable, therefore, for architects to make a special study of the problems of the garage, public and private. Recently, as one of many instances, the ability of an architect to design a practical private garage brought him an attractive commission in residential design.

This will be found an interesting and profitable field of activity and one in which a reputation can be quickly built. A study of the requirements in such buildings is not difficult as there are no indefinite quantities to deal with.

Building Now — From the Investor's Viewpoint

AT the present time a large proportion of the business in the average architect's office is in what might well be termed a planning stage. There is, of course, considerable activity in the erection of moderate cost dwellings, both as private and as speculative operations, and considerable public work is now proceeding; but in the field of investment building no real activity is taking place and there is a noticeable tendency on the part of prospective owners and investors to put off the actual commencement of construction work on apartment houses, office buildings, hotels and similar structures.

Since the close of the war has released building activity, as far as Government restrictions are concerned, there have been two definite reasons advanced for not beginning construction in the field of investment building. The first of these reasons relates to financing in the form of building and permanent mortgages. The second reason is apparent fear on the part of investors that buildings constructed now, at the present high level of building material prices and labor costs, will show a too great depreciation in value at such time as there may be a general decrease in building costs.

It is quite true that mortgage money has been difficult and expensive to obtain in the period following the armistice. The first noticeable release of pressure in this respect followed immediately after the floating of the Victory Loan. Since that time there has been a gradual opening up of the mortgage market, and the conclusion of peace, with a definite reopening of world credits on a sound economic basis of commercial relations, has brought into the field a considerable quantity of mortgage money. For the first time in some years mortgage brokers and loaning institutions are advertising the fact that they have money available for sound building operations.

The general attitude of loaning institutions is now distinctly favorable to real estate and building operations. In the Borough of Manhattan, New York City, mortgages approximating $8,500,000 were renewed in January of this year as opposed to $2,800,000 in January of last year. Mortgages are now generally being renewed without demand for a reduction of principal, which is a fact significant of the confidence of experts in the maintenance of future values in real estate.

We find, therefore, that the first reason for hesitancy in starting construction, namely, the difficulty and cost of financing, has been largely eliminated. There remains, then, for serious consideration the one principal obstacle now standing in the way of actually building apartment houses and office buildings. This is the question of the soundness of investment at high costs and possible greatly lessened reproduction values in the more or less distant future.

To fairly and seriously consider this question, there are certain essential facts which must be determined in order that by their interrelation a basis may be established for the guidance of those who are at present considering building investments. The average architect will find these related facts of value in discussing with clients the feasibility of carrying out immediately projects which may be under consideration.

In making this analysis we shall take into consideration, not only the facts and figures relating to construction costs and building income, which have been gathered and correlated by THE ARCHITECTURAL FORUM, but also the result of a careful investigation which has been made along these lines by the Division of Public Works and Construction Development of the United States Department of Labor.

The facts which must be determined are as follows: (1) increased cost of land for building operations over prevailing costs during the pre-war period, (2) relation of land costs and increment to a present-day building investment, (3) increase in building material costs over the pre-war period, (4) increase in building labor costs over pre-war period, (5) increased annual income, (6) increase of maintenance cost, (7) estimated period of years until building costs decline to pre-war level, (8) establishment of a method of meeting any such depreciation through the creation of a sinking fund.

LAND AS A FACTOR IN BUILDING INVESTMENT

The pet phrase of the real estate broker to-day is, "Everything but land has gone up in cost — land is next to rise — buy now!" This is sound advice as it pertains to any section of a city where good transportation conditions predicate rapid growth in supplying a demand for housing in multi-family units. It is sound advice also in relation to any land available for office and business buildings. In other words, real estate available now, or in the near future, for any type of investment building, is cheap at its average cost.

The value of such land is naturally determined by the law of supply and demand. During the war the demand for such land was small, owing to the curtailment of building operations. Now we are at the beginning of a period of increasing demand, owing to the general encouragement of building.

Land cost in any investment building project usually represents from 20 per cent to 30 per cent

of the total cost of the operation. We find, therefore, that one-fifth to one-quarter of the cost of a building investment can be had at pre-war price or less, and that here we have a definite increment or potential increase in value.

Translated into figures, based on general land value increases in good investment neighborhoods, we find that the increment represents at least 10 per cent a year for the first ten years — or 20 per cent of the total investment over this period. In many cases the increase in land values is relatively much greater. It is evident, therefore, that an important point in the present-day building investment is the selection of a site so located that it shows every evidence of a fairly rapid increase in value.

The question of the actual increase in building material costs has been given careful investigation by the United States Department of Labor. Experts of this organization have found that at the close of the war building material prices (not including steel) had risen to 61 per cent above those of 1913; while general commodities were 113 per cent higher. The average increase in wages in building industries in 41 cities was 29 per cent.

If we consider for the purpose of figuring the general increased cost of building that the pay-roll represents 40 per cent of the operation, we find that two-fifths of the cost of a building has risen 29 per cent, and the remaining three-fifths has risen 61 per cent. This gives an average increase since 1913 of approximately 50 per cent of the cost of the building.

How Long before Costs Reach Former Levels?

The next question of interest is — how long a period will probably elapse before material and labor prices decline to equal those of the pre-war period? In other words, how fast will the value of a building constructed to-day depreciate because of lessening reproduction value?

Turning to conditions following the Civil War, we find interesting comparisons. In both wars building material prices rose, but they did not at either time reach levels as high as those of other commodities. It was thirteen years after the Civil War before general prices returned to the pre-war level, but the index figure of building materials remained higher than other products for about twenty years.

After the Civil War the principal cause for a final return to pre-war price level was the rapid development of new and more economical production methods — both as to machinery inventions and improved business organization. The chances of offsetting higher prices by improved production methods in the present period are not particularly interesting. The possibility that entirely new price levels have been established by the economic influences of the world war is becoming apparent to all. Certainly, economic forces seem to have operated in stabilizing prices at a high level from which they are not likely to fall for many years.

The attitude of labor also bears importantly on a general forecast of building conditions. Labor forms a large proportion of the activity in the manufacture of building materials and in actual construction work. Unionized labor has apparently adopted a platform of wage scale maintenance at present levels, and this condition will naturally help to maintain prices at higher than pre-war levels.

Judging from the various points brought out in the foregoing paragraphs, it is evident that building costs will not for many years come back to former levels. The demand in this field incident to forced construction (to make up for slackness in the past few years), together with a call for certain building materials for export purposes, will allow of no great reduction in present prices. At the most, it is apparent that the greatest drop which can be expected in the next ten years will not exceed 25 per cent of present cost of building.

We have, therefore, a condition indicating during the next ten years an economic or reproduction depreciation averaging not more than 2½ per cent annually on the cost of building; or, considering land value at 20 per cent of the entire operation, the greatest depreciation to be feared, as far as replacement value is concerned, would be an annual average of 2 per cent of the total cost of an investment operation over a period of the next ten years.

The next point in favor of carrying on investment building immediately is the opportunity to make desirable leases at high rentals. In many cities the demand for space in office buildings and multi-family houses is so acute that rentals have risen as high as 50 to 60 per cent above pre-war rates. Reports from owners of investment buildings now under construction show large proportions of rentable space leased from plans at favorable rates. Many business concerns are now in course of expansion and desire new quarters. Thus we find office, warehouse and loft space in demand.

Rentals will undoubtedly be maintained for many years on a higher basis than we have heretofore experienced. There is a general tendency on the part of the people in American cities to live under better housing conditions than in years past. For this reason, and as local experience at many points has shown, even when the housing shortage has been met, there will be a steady demand for better class apartments with all modern improvements. The same condition holds good in relation to the housing of business activities.

Disproportionate Increase in Cost of Maintenance

In spite of the contention of many landlords who have been asked to explain the reason for rapidly increasing rentals, the cost of maintenance in the average apartment house and office building has not increased in proportion to the rental value of space in investment buildings. On the other hand, it is quite evident that rental values have increased generally to a point where at least the same gross percentage of return on the total operation cost of a new building can be expected.

Briefly analyzing building maintenance and operation costs, to see why they have not increased in proportion to the average increase in the value of rentable space, we find the following elements entering into such cost, together with approximate percentages of gross rental:

Operation Cost Elements	Relative Percentage of Gross Rental Income
(1) Interest on first mortgage	23%
(2) Interest on second mortgage	5%
(3) Vacancy allowance and repairs	10%
(4) Light, heat and power	6%
(5) Taxes (land, building, water, etc.)	12%
(6) Insurance	3%
(7) Service (superintendent, janitor, etc.)	20%
(8) Net profit	21%
	100%

Considering the above elements which enter into the administration costs of the average investment building, we find that on the mortgage interest items, (1) and (2), there has generally been an increase of not more than one-half per cent, if any, since before the war. On item (3), vacancy and repair, there has been and will be for some years in the average investment building little if any charge for vacancy, owing to the demand for space. This more than offsets the increased cost of repairs so that on item (3) we find no increase.

On item (4) the increased cost does not average over 20 per cent.

On item (5) there has been little increase in assessment values or tax rates affecting the average investment building — not over 10 per cent increase at most.

On item (6) no increase.

On item (7) 30 per cent increase.

Estimating the above analysis, we find that maintenance costs have increased approximately 11.5 per cent of the former gross rental, while rental values have increased at least twice as much.

Protection against Decreasing Reproduction Values

Two distinct factors which will operate to protect the present-day investor against loss through depreciation in reproduction values are: (1) high rentals making possible the establishment of a sinking fund; and (2) the general upward tendency of the real estate market, insuring an increment in land values which in itself practically constitutes insurance against loss.

An interesting phase of the building investment field to-day is the possibility of building and leasing to one responsible party for a long period of years. Such leases are usually made on a basis of 50 per cent of the value of the land and 6 per cent of the cost of the building as an annual rental payment. On a similar basis to this New York City's two new hotels, the Pennsylvania and Commodore, have been built and leased. In the case of the Commodore lease, an additional 2 per cent of the cost of the building was provided, undoubtedly as a sinking fund.

Establishing a Sinking Fund

It is certain that such investment buildings as may be undertaken at this time can be located in sections where demand has placed rental values on a high basis. The buildings can be advantageously leased to one or more tenants for periods of from three to twenty-one years, depending upon the character of building and occupancy.

When rental prices are being fixed, careful consideration should be given to the establishment of a sinking fund which may return directly to the owner over a period of years an amount of money to equalize any investment depreciation due to decrease in replacement value of the building.

The amount of this sinking fund should be calculated by percentage and should be sufficient to return at least 20 per cent of the cost of the building within ten years after its completion. It is evident, therefore, that the percentage amount of the sinking fund will be determined by the character of occupancy and the length of leases.

In a $100,000 operation, of which $25,000 represents the cost of building, the sinking fund should amount annually as follows (minimum):

$3,750 (5%) for 4 years or less
$3,000 (4%) ,, 5 ,,
$2,250 (3%) ,, 7 ,,
$1,500 (2%) ,, 10 ,, ,, more

The various classes of buildings which come under the general heading of investment structures are then: multi-family dwellings (more than three families), loft and warehouse buildings, office buildings, leasehold buildings (hotels and mercantile structures for single tenants such as large corporations).

Month-to-month rentals in any such buildings are, of course, out of the question; but the length of the lease term varies in a fairly definite manner in each class. Thus we find apartments and office space leasing for periods of from one to three

years; loft and warehouse space from five to ten years (except buildings constructed for single tenant on longer term leases); public garages and stores are leased for periods averaging from five to ten years; and structures built specially for long term leases, such as hotels and various classes of mercantile buildings.

It is evident that the approximate annual sinking fund charge for each class of buildings is determinable. Referring to the preceding table and in view of short term leases, a sinking fund amounting annually to at least 5 per cent of the cost of building should be added in determining rental charges for office and apartment space. At the present time there is in practically every section of the country a shortage in such space which has resulted in high rental rates. This shortage, with consequent high rents, will last for several years until the supply meets the normal demand.

It is during this period that the investor in short term rental buildings should receive sufficient income to provide his sinking fund for future years.

If upon analysis of rentals being offered in any given neighborhood, it is found that the income from rental space, as shown by the plans of an apartment house or office building, is not sufficient to include such a sinking fund, a better location for investment building should be sought.

In classes of investment building involving longer term leases, the provision of a sinking fund, while equally important, is a more simple matter. The amount can be spread over a greater number of years. In such leases, particularly those involving the starting of a new business venture, it is customary to grade the rental charge to make the first years easier for the tenant's growing business.

It is not, of course, necessary or advisable to define the sinking fund as a separate payment in the lease. It should be counted and treated as one of the regular operation and maintenance costs; but on the owner's books the return from this source should be credited against the principal investment.

The Building Labor and Material Market

AT the present time the condition of the building labor and material market is at best puzzling, and before attempting any building operation or even design a most careful investigation should be made of local and general market conditions at the point where construction is contemplated.

The material market reports and quotations which are generally circulated through various service media do not seem to have practical application at this time. In many instances such quotations are based on information received from dealers having knowledge of the purpose of the information. There is at present a very great difference in the tentative material prices which are advanced and the actual cost of specific quantities of material in buying. Dealers will not commit themselves for any length of time nor in a definite manner.

For instance, we are informed by a builder operating near New York that in the early part of August common brick in New York was actually selling at $24, while general service quotations placed it at $15 to $17. At the present time the market on common brick in New York is easing down somewhat, owing to large shipments and undoubtedly influenced by decreased takings due to the strike and lockout which is entirely holding up construction in New York.

Among builders there seems to be a clearly expressed opinion that lumber prices are in many cases held up by dealers who are holding plentiful supplies for a still higher market. There seems to be little doubt that in some localities this has been done. The producers of building lumber might well investigate this phase of the building market and take steps to prevent the immediate raising of local lumber prices in towns where new building projects are being started. In one instance coming directly to the notice of the writer a number of dwellings were started in a large town in New York State. Contrary to quoted prices, local lumber dealers asked a considerable advance when actual buying commenced. By the uniformity of price raising it was evident that more than a coincidence was involved. Fortunately estimates had been made on higher prices than quoted in order to provide a safety margin, and a purchase was made in outside territory which made it possible to come within the figure of the contract.

There is another factor which apparently is to affect the cost of building materials, particularly basic materials. There seems to be a rapidly developing export market for many types of building materials. Recently a lumber dealer, finding difficulty in getting spruce and Oregon fir, visited the West and is reported to have seen in Seattle fifty ships loading with this timber for export to Japan. The organization of building material producers under the Webb act shows definite intention of developing the export business during the time that excessive demand cannot be met

abroad. From various provisional and staple foreign governments inquiries for many classes of building materials are being received in this country.

It should therefore be evident to the average architect that the present market is one requiring more than ordinary attention and analysis. It will prove of great service to form the habit of discussing costs of labor and materials with one or more active builders in localities where buildings are being planned.

The Question of Labor

The activities of organized labor in the development of demands, including nationalization of important basic industries, is perhaps the most interesting of national questions to-day. This activity is directly affecting the building field and is acting strongly in suppressing building activity. Immediately upon the announcement of any drastic action on the part of powerful labor organizations a reactionary wave seems to pass through other classes of labor, particularly that of the building trades. In estimating costs it is not safe to base them upon existing rates in any given locality, particularly if the building operation is extensive and outside the larger cities. The safest method is to select a point where building of a somewhat similar nature is going on, and to determine the increase in rates which has taken place. A similar increase should be figured as a safety margin, for it seems to be the history of the average building job now that the building is not finished on the same rates upon which it was started.

In the designing of dwellings some architects are cleverly analyzing labor conditions in the locality for the purpose of determining whether masonry or carpenter labor is more easily available. In such cases houses are designed of materials suited to labor conditions. In some sections of the country it is practically impossible to get carpenters, while at other points good masons are scarce.

Cost Plus or Straight Contract?

For many months there has been considerable discussion among members of the building fraternity as to advisable forms under which contracts for building should be undertaken. At least four distinct types of contract have been developed: (1) The straight or fixed price contract, the ordinary form of building contract (involving a guaranteed cost to the owner with payments to the contractor at agreed stages in the progress of construction); (2) the straight cost plus method; (3) cost plus upset price (material bills and pay-rolls paid by owner plus percentage to contractor who sets and guarantees a maximum cost figure); (4) cost plus lump sum contractor's profit (all payments by owner and definite amount of money assigned as contractor's payment for completing the job).

It is not the purpose of this article to point out the relative advantages and disadvantages of these various contracting arrangements. Present conditions in the building labor and material field indicate that except under unusual conditions the straight lump sum form of contract is being abandoned and builders are generally refusing to do business on this basis. In many instances the cost plus upset price contract is being used successfully, but in the last few weeks many large and small contracts have been let on a purely service basis of the cost plus contract.

Reading from the actual experience of builders, the fluctuating cost of materials, difficulty in deliveries and unsettled labor conditions, it is evident that the provision of guaranteed costs by the contractor is not only a plain gamble, but is practically impossible and inducive to constant friction between the parties to the contract. Theoretically, under given conditions, the cost of the building will be the same regardless of the form of contract. The real element for consideration is the efficiency and honesty of the service provided by the contractor. Concerning this question certain facts may be deduced. Paramount, perhaps, is the power of the contract form in its influence on the relationship of the two parties. Under pre-war conditions of well stabilized material cost, the straight contract, honestly administered, created a friendly and satisfactory relationship between owner and contractor. To-day conditions have been practically reversed. After a straight building contract has been made under present market conditions, the tendency is for the two parties thereto to rapidly reach an unfriendly and dissatisfied stage, owing to unforeseen difficulties met by the contractor and the insistence of the owner that the guarantees of the contract be carried out. On the other hand, if the contract form be on a cost plus basis, the problems of both parties become mutual, and the resulting co-operation may be trusted to meet present-day difficulties in a manner impossible under the irritating operation of the straight contract.

It will be found that for other reasons than those of direct financial gain the average builder will respond in a most satisfactory manner to the cost plus contract. This is an opportunity to show a real service. He has a reputation for good work to make or to retain. If his reputation is poor, he will naturally not be retained on this basis. The recognition of the hampering effect of stringent contractual conditions is proving the solution of many difficult building problems to-day.

Palazzo Massimo alle Colonne, Rome

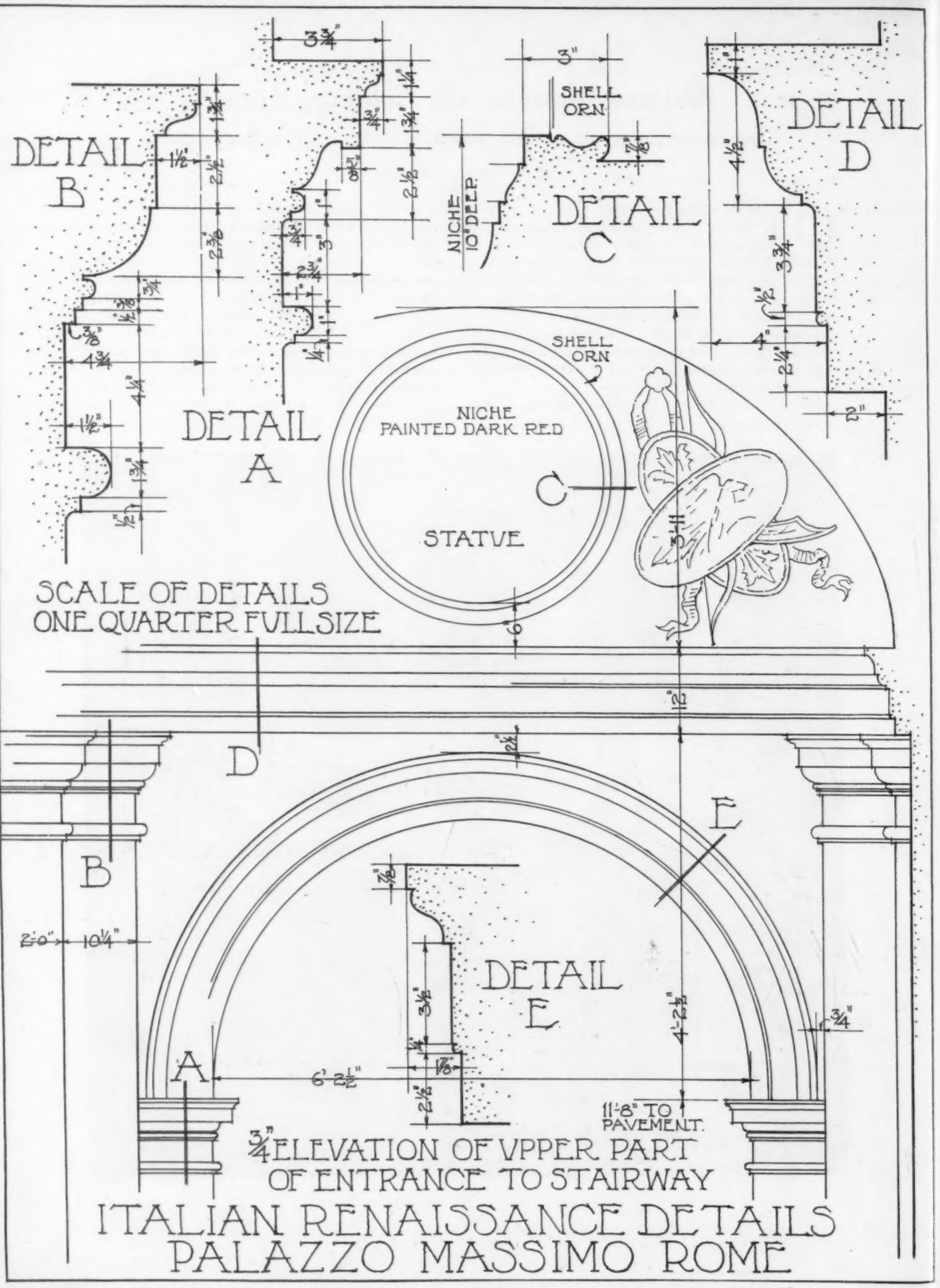
ACCOMPANIED BY MEASURED DRAWINGS OF DETAILS OF THE COURT

By HOWARD W. GERMANN

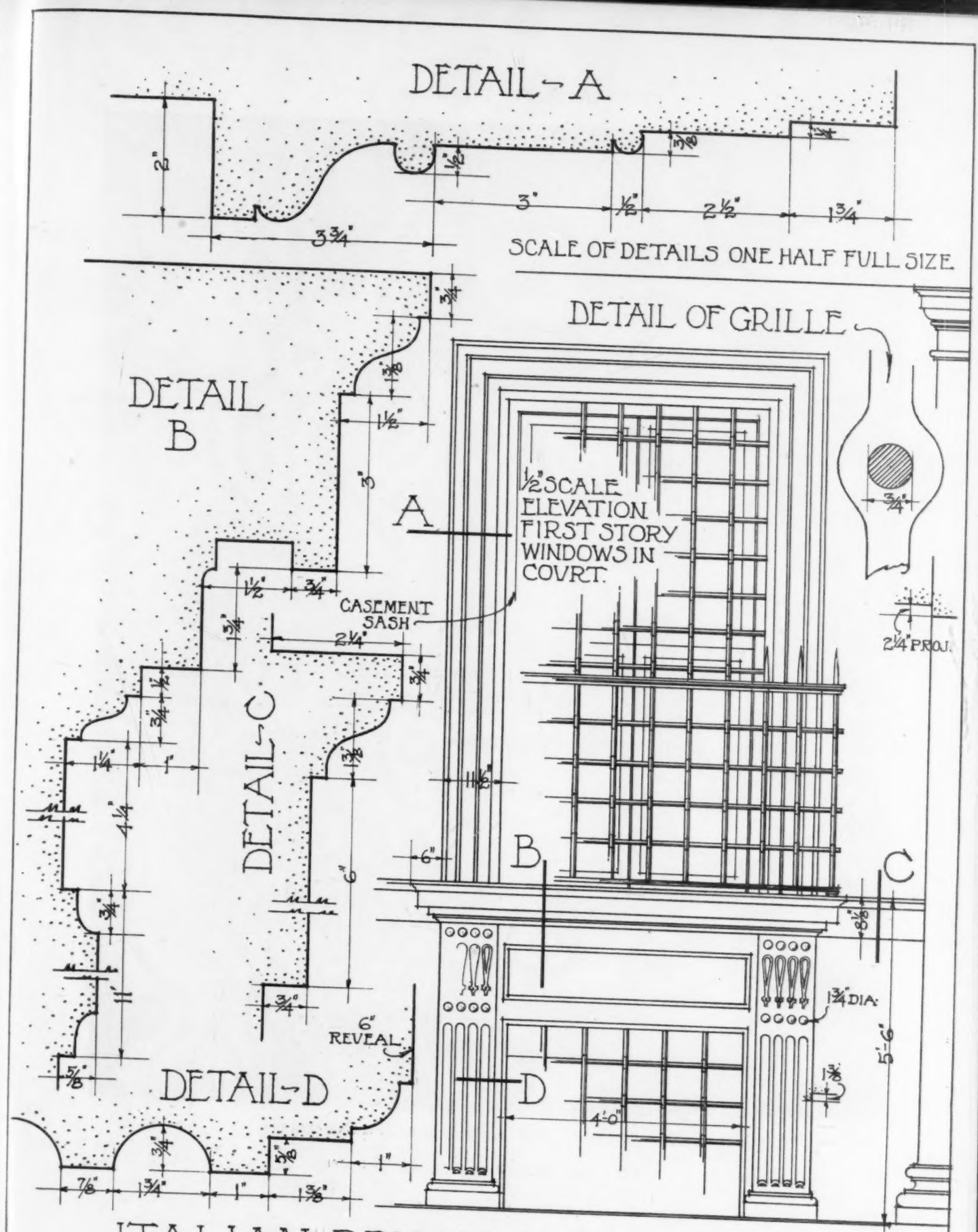
ONE of the noblest and most elegant palaces of the Renaissance is the Palazzo Massimo alle Colonne in the Corso Vittoria Emanuele at Rome designed by the Sienese painter and architect, Baldassare Peruzzi (1481–1536), for the Pietro Massimo family. This palace, commenced only a short time before the architect's death, shows considerable ingenuity of adaptation to an irregular site, the arc shaped façade was skilfully designed to conform to the curve of the originally narrow street but has now lost its effect by the construction of the wide Corso.

The principal façade of the palace is enriched by a beautifully detailed vestibule with Doric columns, and the interior court, or quadrangle, which is reached from the Corso by a vaulted passage, is strikingly picturesque with its stone pavement, wall fountain and its flight of steps by which the chief entrance to the palace is gained. The entrance hall has a frieze and ceiling of most elaborate detail.

Serlio (1475–1555), with whom Peruzzi was intimately associated and to whom he bequeathed his notes and drawings, says that Peruzzi during the excavating for the first Massimo Palace found many fragments from the Theatre of Marcellus and learned so much concerning this ancient edifice that he was able to make drawings showing its original plan.



ITALIAN RENAISSANCE DETAILS
PALAZZO MASSIMO ROME



ITALIAN RENAISSANCE DETAILS
PALAZZO MASSIMO ROME

DETAIL OF STAIRWAY AND VAULTED PASSAGE AT END OF COURT

PALAZZO MASSIMO ALLE COLONNE, ROME

The Relation of Steel Framing to Architectural Design

By E. N. PIKE

(This article, written by Mr. E. N. Pike, chief engineer of the New England Structural Company, is one of great interest to all architects. Mr. Pike's familiarity with steel construction of all sorts places him in a position to present authoritatively an article of interest regarding the relation between steel work and architectural design.—EDITOR.)

IN the beginning of architecture, if that be a proper term to use, the structural features of a work of any magnitude were much in evidence, and much of what we think of as architectural detail has grown out of the attempt to conceal or render less objectionable to the eye some of the essential features of primitive construction. In earlier days, therefore, structural and architectural design were so closely related that they could not be considered separately. It was not until by experiment and by the use and combination of various materials and the gradual increase of ornament to conceal the structural features that it became at all possible to put structural design in a secondary position. The introduction of the steel frame or skeleton into building construction requiring comparatively little room for itself has made it possible to postpone the consideration of structural design to a relatively late period in the preparation of plans and has tended toward specialization, so that to a very large degree the structural designer is not an architect, and the architect need not have more than general knowledge of the requirements of structural design. It follows naturally that the best result will be obtained by co-operation of specialists in the two branches; but the way in which many projects begin to shape themselves makes it impossible to secure ideal conditions, and the structural engineer is often confronted with problems that tax his ingenuity to the utmost and, if solved, may leave much to be desired, if everything were known.

Present-day prices for building work demand, as never before, the reduction of all costs to a minimum consistent with the results to be obtained. It might seem true that a building, the several items of which were obtained at a minimum cost for its special field of usefulness, would be the cheapest to construct. It would be readily appreciated, however, that a building of materials involving large heat losses, even though cheap in themselves, is not necessarily economical, and it is equally true that the design of a steel frame, using the fewest possible pounds of steel, may not result in the cheapest or most satisfactory building. There is so much data available at the present time, in handbooks and trade publications, that it seems a very simple matter to design buildings of considerable magnitude. That it is so often done successfully, speaks well for the value of the literature referred to and the common sense of the user. It is probably true, however, that few designs involving the use of one hundred tons of steel would not have well justified the fee of an experienced designer. Competitive design for steelwork, that is, the attempt to reduce the cost of steel from a preliminary design, regardless of other considerations, is often a doubtful economy, especially if the original designer is not consulted as to his reasons.

The element of time is also one that should be given more consideration. Ordinary every-day problems require only sufficient time to guard against the mistakes that are always incidental to haste. If the problem is more complex and the time too short, it follows that the first passable solution must be used, although it may be unsatisfactory to the designer. Lack of time to consider carefully the relation of steel design to other features of construction often fails to secure the benefit of the experience of the engineer. It follows, therefore, that whether the actual steel design be made at one time or another, it must not be overlooked at any point in the development of the architectural scheme, and that the sooner the steel plans are undertaken the better the results are likely to be.

It is only necessary to note that the erection of steel frame should follow immediately the completion of foundations to indicate the relative position of steel plans to other details. Commercial considerations often deny it the position it deserves. It may be the hope of a drop in prices; it may be the hope of finding a lower bidder; it may be simply failure to appreciate the time that the steel contractor should have; but too often the letting of steel contracts, and sometimes the preparation of plans, is delayed until the steel is actually

needed at the building. The first two reasons are too deeply rooted in human nature to be easily removed. The third may often be due to lack of information, and, while perhaps not strictly related to our subject, may deserve brief mention. The lowest prices for steel construction are usually dependent upon sufficient time to secure material from mills cut to length for use without waste. For standard sizes of material in common use and minimum weights, rollings at mills may come at frequent intervals of three to four weeks; while for material less generally used the intervals may be greater, depending upon whether the mill has accumulated sufficient orders to justify it in changing rolls, and sometimes upon the ability of the mills to provide billets of proper size from which the material can be rolled to advantage. Schedules for rolling are usually made up in advance and are often closed so far as additional orders are concerned some time before the date of rolling. This may help to make it clear why such exasperating delays sometimes occur, and perhaps make it clear that ample time for preparation of details and fabrication may not be at all adequate to secure prompt deliveries. It also explains why the experienced designer dislikes to use any but sections most easily obtained, unless the quantity required and the saving obtained will justify the possible delay. If the resulting loss to the owner, due to delay in completion of building, is given a proper value, it will frequently be found that the economy secured in handling the steel contract is of negative value.

The structural engineer would lose much of the joy that should be his if he could have his way in defining hard and fast rules for our subject, and we should doubtless lose much of architectural effect if the architect were handicapped with a sixth sense that would prevent him from asking the impossible of the designer. It is true that the experienced designer recognizes at a glance certain limiting conditions in the average problem that cannot well be overcome, yet he is often held back by recognized limitations of economy to a greater or less degree. Very often the limiting conditions for depth of girders or trusses will not permit of any approach to economy, and it is here that the necessity for co-operation is most evident. Unfortunately many times conditions have been so fixed before the engineer has been consulted that it is well nigh impossible to make any change without serious embarrassment to some one, and the real problem of the designer is to determine how far he may go from the beaten path that others have followed and not invite disaster. The failure of the first Quebec Bridge is a conspicuous instance of what may happen to even the most experienced if too far from conservative practice. It will be found, however, that the majority of failures which might be hastily assumed to come under this head have been due, for the most part, to overlooking or disregarding some of the seemingly less important features of design or detail.

Architectural conditions often invite eccentric loading of columns, or connections that should be avoided or overcome by suitable design or detail. Too frequent splicing of columns to secure an apparent saving of weight are frequent errors of the inexperienced. The use of material not readily obtainable, as before explained, may be a source of vexatious and expensive delay. Zee bar columns, for instance, were for a long time in common use, but for one reason or another have fallen into disfavor, and should not be used under any ordinary conditions, and not at all until the possibility of securing them has been determined. Tradition has apparently fixed in some offices the size of material to be used for certain minor details, as lintels and the like, without much regard to actual needs — not a serious matter, perhaps, when steel is cheap, but well worth saving at any time.

Economical steel design can be obtained only when the designer is in possession of all the data relating to loads and limiting conditions connected with his problem. Frequently some of these items are lacking, and he must either play safe or wait.

If a building is obviously of a type that must require wind bracing, it should be carefully considered in relation to architectural details, and if the problem is at all difficult, the best advice obtainable is the cheapest. Probably no single feature of design invites more discussion than wind bracing, and the designer is usually fortunate if the Building Code provides definitely for requirements that are evidently safe.

Foundations are, of course, closely related to steel design, and the determination of maximum loads is usually a part of the design in which the question of wind bracing may be a considerable item if the building be high and relatively narrow.

The increasing use of Bethlehem or other beams with wide flanges often results in a conflict between structural details and the best conditions for installation of plumbing or other piping. The steel designer, and if he does not, the steel fabricator, will prefer to have all beams frame on center lines of columns where at all possible. The reasons are, of course, obvious, but it may be desirable to place the beam a little to one side of center for convenience of the plumber, or to avoid a plaster beam in the finished ceiling where it would be unwelcome. How much eccentric loading is permissible, or how its effects can best be overcome, is one of the things frequently passed

over lightly. Nothing but the additional factor of safety involved in the loading used has prevented much unpleasantness from this cause. Much of the difficulty from this condition could be avoided if taken in time, and it is probable that steel designers have been at fault in accepting this condition as inevitable instead of avoidable.

It may seem that much of what has been said is merely a plea for larger use of the steel specialist. Probably this should be done, but if done efficiently would in time eliminate many of the things that we now do from force of habit, or that we copy as a new idea from whatever source it comes to us. There should be a more careful study of the right relations for economical construction for all trades, so that the plumber or the steamfitter may accomplish his work with a minimum and not a maximum of fittings. There is probably more to be gained in this line of endeavor, at the present time, than one realizes, and in the survival of the fittest that these times will surely bring only those may hope to live who can demonstrate that they accomplish the utmost of satisfactory result at minimum cost.

There is, perhaps, a type of industrial building where the engineer, and not the architect, has been too much in evidence and where the matter-of-fact engineer has felt able to undertake work that did not rightfully belong to him. Much of the ugliness of this class of building may be avoided, at little or no increased cost, if right relations between architectural and structural design are considered instead of mere utility.

It may be asked, whether the architect should attempt the preparation of his own steel plans. The answer should be, that if the amount of work handled in his office will justify the employment of an experienced designer, one who can intelligently and sympathetically work with him, the best results will be attained. Otherwise it will be wiser to retain, as required, the services of the best talent available, giving the structural designer full opportunity and information that he may make his service as helpful as possible.

A New Type of Reinforced Concrete Floor Construction

By EDWIN F. ALLBRIGHT, CIVIL ENGINEER

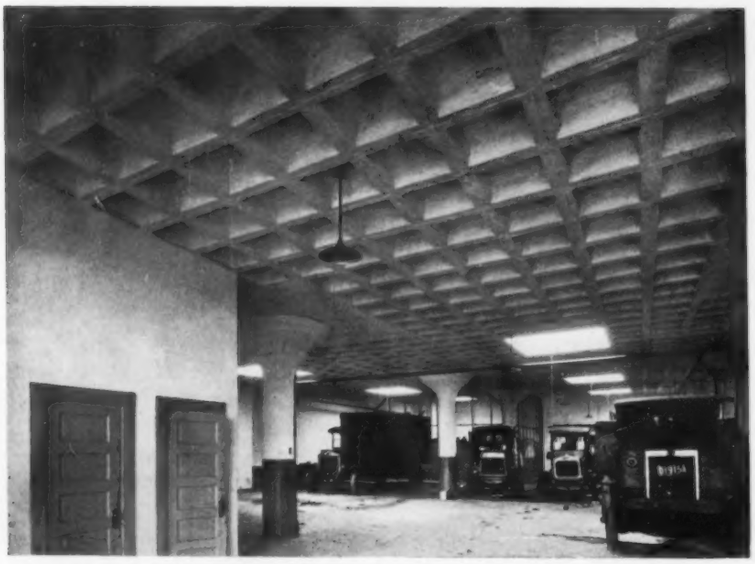
(The system described in this article by Mr. Allbright is, so far as known, the most recent development in the line of concrete construction, and in this presentation is the first description of this system which has ever been made public. THE ARCHITECTURAL FORUM is very glad to present to its readers systems of construction of this sort, particularly when they can be presented before reaching them through other mediums.

We hope later that Mr. Allbright, who is the inventor of this system, will present further details to our readers, as from the standpoint of economy and rapidity of construction — it would seem that this method might readily be adopted.— EDITOR.)

THE cost of buildings at the present time is high, even though construction operations have been far below normal, and it is generally accepted that high prices will continue for a long period. Materials have become fairly stabilized though some classes show even a further rising tendency, but there is a widespread spirit of unrest and dissatisfaction among labor. Strikes have been called with practically no construction work going on. When building operations really get under way on a large scale, as is inevitable within a few months, there will be a shortage of common labor due among other things to the large numbers who have gone back to their own countries and to the lack of immigration into this country for several years. The law of supply and demand and the probability of contractors bidding against each other for workmen may raise the scale of wages for labor even above the present high level.

Under these conditions anything that will cut down the usual amount of material and the number of hours of labor required to produce a certain piece of construction will be welcomed and investigated with keen interest by all having to do with building operations. The new type of reinforced concrete floor construction described in this article is called the "Grid" system, on account of its resemblance, looking at it from below, to the grid or waffle iron. In changing from structural steel to reinforced concrete construction, a great advantage results from the fact that the latter construction is cast monolithic in place instead of being assembled at the building from a number of separate structural members. Of course this has been gained partially by computing for continuity instead of for simple spans; but it would seem that still further advantages should be had. The most economical, and therefore the ideal, type of construction to attain would be that system in which every part of the structure is working up to its capacity or up to its allowable stress under the loading for which it is designed. The new Grid system aims to accomplish this result and is a radical departure from most of the older methods.

The Grid system consists of columns with column capitals, a solid slab projecting beyond the capital with cantilever effect, and a slab with recesses in the under side throughout the remainder of the bays or panels extending to the margins



Detail View of Garage Showing Grid System of Floor Construction

of the solid portions, the ribs between the recesses being reinforced with bars near the bottom, and the solid portion over the columns being reinforced near the top. The recesses are obtained by the use of removable forms. These forms or pans are of sheet steel and are designed so as to permit of simple installation and of easy removal after the concrete has been cast in place.

One of the features of this system is the centering to support the pans. This consists of a simple arrangement of wood members, which allows the pans to be removed in a short time after the pouring of the concrete.

After the wooden centering has been erected and the forms placed the reinforcement is laid. The concrete may be poured from buggies operating on runs or a spouting system may be used. When the concrete has set sufficiently to carry its own weight on the short span between shores, the centering with the exception of the shores may be removed. The forms are oiled before the reinforcement is placed and they come out very readily. The shores are left up in their original position with an undisturbed support to the concrete until the concrete has set up enough to be self-supporting, or if the building is going higher the shores for the next floor may be placed directly over those below.

The first question an owner, architect or contractor asks about any new type of construction is, "Has it been used in actual construction work or is it merely on paper?" The first building in which the Grid system was used was constructed in the spring of 1918 under the very trying conditions then prevailing for all contractors doing private work. A second building was completed the following winter, and the third and fourth building in which this construction is being used are now under way.

In the early part of 1918 this type of construction was presented to the Army Engineers at Washington, offering the use of this system for warehouses, etc., which were in urgent demand especially near the seaboard. The merits of this new construction were generally recognized by them, both from the standpoint of speed in construction and from the economies effected. But due to the sudden termination of the war, which caused an abrupt ending of all building operations carried on by the Government, it was not used in any of their buildings.

The first contract in which the Grid system was used embraced an area of 11,000 square feet. It was difficult to get materials, carpenters and common labor, but the real difficulty arose in getting the removable steel forms made. A manufacturer with the necessary presses and a supply of the proper gauge sheet steel was finally located. Two sets of dies were made and carried to the presses. Just at this time the manufacturer received an order from the Government for a large quantity of trench periscopes. This order received precedence and delayed further work on the pans for four or five weeks. When the pressing was finally started it was found that the metal on hand was too hard and brittle to draw down, and no other could be obtained. The pans were finally made of a lighter gauge metal by a different process. These pans, although considerably lighter than was thought necessary, have stood up very well. Under all these difficulties the merits of this construction were so great that the building was carried through successfully with a remarkable saving.

The advantages of this system of floor construction are: saving in concrete — the portion of the floor in which the pans are used is about five-sixths of the total area. The depth of pan to be used and the thickness of concrete over the pans depends on the span, live load and use to which the floor is to be subjected. It has developed that a pan 8 inches deep works out nicely for a considerable variety of spans and live loads. From a number of designs made the saving in concrete amounts to between 20 and 30 per cent over the usual flat slab construction. This saving amounts to between 30 and 45 pounds per square foot.

Saving in dead weight, — the above saving of 30 to 45 pounds of dead weight of construction affects the columns and column footings. Smaller columns and footings may be used or a less number of piles. In a 6-story building with bays about 22 feet square and a live load of 150 pounds per square foot, there would be a saving of two concrete piles, or about 15 square feet of area on a soil with bearing value of four tons per square foot. There is a wide variety of opinions as to the proper live load reductions to make on columns, but any saving in the dead weight of floor construction is a definite and positive saving in the columns and foundations.

Saving in steel reinforcement, — there is a saving in the amount of reinforcement required on account of the decreased dead load. In some cases it has even been found economical to make the total depth of construction more than the thickness of the usual flat slab. For instance, where a 9-inch slab and a 2-inch dropped panel or plinth would be required, an 8-inch pan with 3 inches of concrete above the pan has been used, making the bottom of the ribs flush with the bottom of the plinth. This arrangement produces a construction weighing approximately the same as a 7-inch solid slab, but with a total depth of 11 inches as against a total depth of 9 inches for the usual flat slab. If the clear story height is taken to the under side of the plinth, as is often done, this arrangement does not require any increase in the height of the building over the usual flat slab construction. Comparative designs show the saving in steel to be between 10 and 20 per cent.

Longer spans may be used, — on account of the saving in dead load and a deeper and therefore stiffer construction, as explained above, longer spans than are usually laid out may be used. Economies have been effected up to 30-foot spans thus far.

Saving in centering, — the uprights or the shores may be spaced further apart on account of a less amount of concrete to support. With the exception of the batter boards only dimension lumber is used, and there is a good salvage value in this kind of lumber, the removable pans eliminating the usual waste in the board decking in the ordinary flat slab construction. Higher buildings may be constructed on account of the saving in dead weight.

Appearance, — the ceiling appearance is attractive, the dull effect and board marks of the ordinary flat slab are lacking. The coffered effect of the ceiling is very pleasing to the eye. The illustrations show the character of the ceilings in this type when no special attempt has been made to obtain any finish beyond the condition as left by the forms. It will at once be apparent that by applying a plastic surface to the beams and coffers an attractive, interesting result may be obtained.

Although the illustrations show the construction as applied to a garage building, the system obviously is applicable to any type of building project where long spans are an essential.

The concrete construction and the means used in producing these results are the subject of Letters Patent and applications for Letters Patent.

Construction View of Garage Showing Grid Floor System

EDITORIAL COMMENT

"AMATEURS" *vs.* PROFESSIONALS

THE daily papers report that at the recent meeting of the National Association of Real Estate Boards at Atlantic City, Mr. William E. Shannon of Washington, first manager of the real estate division of the United States Housing Corporation, created a stir by saying that while the personnel of the Housing Corporation during the war was composed of men who were leaders in their respective businesses and professions, they were, with certain exceptions, amateurs in the business of industrial housing. "They were," he is reported as saying, "in the main full of theoretical European ideas, always looking to England and Germany for examples, and not realizing or appreciating the fact that the American-born industrial worker resented being patronized by his employer or subsidized by his Government. They seemed to think more of what Germany had done, or what England was going to do, than what America had already accomplished, and this made it doubly hard for experienced realtors to direct them into the right channel."

As the personnel, both of the Housing Corporation and of the Bureau of Housing and Transportation of the Emergency Fleet Corporation, was largely composed of architects, the above statement has a direct bearing on the part played by the profession in the war. It is necessary to concede that the avalanche of housing work found many of the architects unprepared, and even their co-professionals who were conducting the respective bureaus have complained bitterly that window boxes, garden walls, oriel windows and lattices seemed to take precedence in some minds over the hard facts of cubage, economical plotting of lots, and strict adherence to ready-make detail work; while specifications often seemed to be more appropriate for the prospective home of a stock operator than of a munition worker. But conceding all this, it is not clear upon just what meat this Cæsar of realty has been feeding that he hath grown so great, and before hastily condemning the creators of American war-housing as "amateurs" let us examine a little into the progress made before the war by the experienced "realtors," a designation which we take to be a euphemism of Mr. Morris Perlmutter's "real-estater" of delicious memory. When we consider that the principal achievements of the latter during a century or so of activity began with the "dumbbell" tenements of New York City, and ran the gamut of the two-story "rows" of Philadelphia and Baltimore, the jerry built cottages of the Middle West and the wooden three-deckers of Boston, and that every effort of far-sighted reformers to eliminate dark inside rooms and common water closets, to reduce the fire hazard and render even a little sun and air available to the tenement dweller, was met with the wail of the real-estater that it "wouldn't pay," we might as well remember that among the thousands on thousands of dwellings built by the Government there is not a single dark or inside room, not a house without proper plumbing and drainage, and hardly one without a bath; that overcrowding on the land does not and cannot exist in the villages laid out by the Government's town planners, and that the standard of æsthetic effect (of no account to the real-estater, it is true) has been fully met in every project. Faults of detail occur, and grievous mistakes were certainly made, but in the final balance we are willing to weigh the hasty work of the "amateurs," even if influenced by English or German models against, for example, the building up of the Dorchester district of Boston; or, although in a different class, even such a masterpiece of the realtor's art as the development of the Borough of Queens, New York.

We question also the value of Mr. Shannon's slur on English and German work and his allusion to the "resentment" felt by the American worker against being subsidized by the Government. The American worker may not like to be subsidized, but judging by his recent attitude he has no objection to getting from the Government unlimited compensation for a very mediocre return in labor. American labor will do well to reflect upon the proposition of a nation which works half-heartedly eight or less hours per day, five days in the week, competing with European nations whose people work hard twelve or fourteen hours a day, six days in the week.

As for the value of German attainments in industrial housing, it is certainly the poorest sort of business not to avail one's self of useful material, even when it is the work of an enemy, and to shut one's eyes to German attainments in any form is as idiotic as the attitudes of those Boards of Education which have discontinued the teaching of the German language.

The architects and town planners employed by the Government during the war worked hard and faithfully for a modern standard of housing. Costs of materials and labor were beyond their control, but we believe that their work has set an example of the greatest value which will have the most beneficial effect on the future of industrial housing in America.